THE EVOLUTION OF A BUILDING

ADAPTIVE RE-USE OF A PAPERFACTORY IN MÖLNDAL

andreabranden@gmail.com
tobias.gothfelt@gmail.com

Architecture and Urban Design - MPARC
Chalmers University of Technology
Gothenburg

Examinator: Sten Gromark
Supervisor: Lisa Brunnström

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CHALMERS
UNIVERSITY OF TECHNOLOGY

ABSTRACT

This work presents an adapted strategy for re-use and transformation design of a former paper factory at the site of Papyrus in Mölndal, Sweden. It is made with focus on a specific building on the site that can become a central place and catalyst for the development of this entire new part of Mölndal. The area is today going through a transformation and we see our aproach as an alternative way in how to go through with the revitalization.

How can an existing building adapt to new functions and a new context? Is there a way to let a building evolve gradually, be a show room of its own history and at the same time create something new that can allow a continued adaptability and changeability?

The site has a rich industrial history, going back to the mid 17th century, when the first paper mill was established. The area is commonly known as Papyrus after the mill that was founded in the very end of the 19th century. Since 2006, no more paper is produced here, and many of the buildings stand empty. Building 10 was one of the first buildings by Papyrus, and was built in 1896.

Presently, building 10 is expressing a motley and rough character and is, in itself, like a collection of time layers. Many changes to the building have been made through the years, and the last ones often with little or no aesthetical consideration. It has been left without maintenance for almost a decade.

The proposal focuses on a strong functional mix inside the building, both public and private. Creative activities in different forms are promoted in order to ensure an economic strength and diversity. The building's users and functions are allowed to be changed, developed, expanded or shrunk; to be evolved.

Contrasts between materials, spaces, new and old help preserve, display and define the building's time layers, and provide patina. The new additions and architectural elements define an evolutionary step of the building, in which it adapts to people and varied functions in contrast to its previous singular function.

CONTENTS

BACKGROUND

During the last decades the western world has evolved from being an industrial society to becoming a society based on services. In the beginning of the 20th century the industries flourished and many large and beautiful factories were built. Later on, the industries moved abroad; increased production with lower costs. Some went bankrupt because the supply and demand changed. The actual factory buildings have been left to their destinies; stagnating, demolished or in some cases they have been discovered as an opportunity for revitalisation.

The valley of the Mölndal river is an area where these factories and big industries have been able to expand during a long time. The power in the water is the main reason for the growth of the industries around Mölndal. The paper mill of Mölndal, most recently called Papyrus, has been an important cornerstone for this developement. Today it is yet another industrial area in Europe that has been left after the factories closed down. Now, however, it will be transformed to an integral part of a new cityscape.

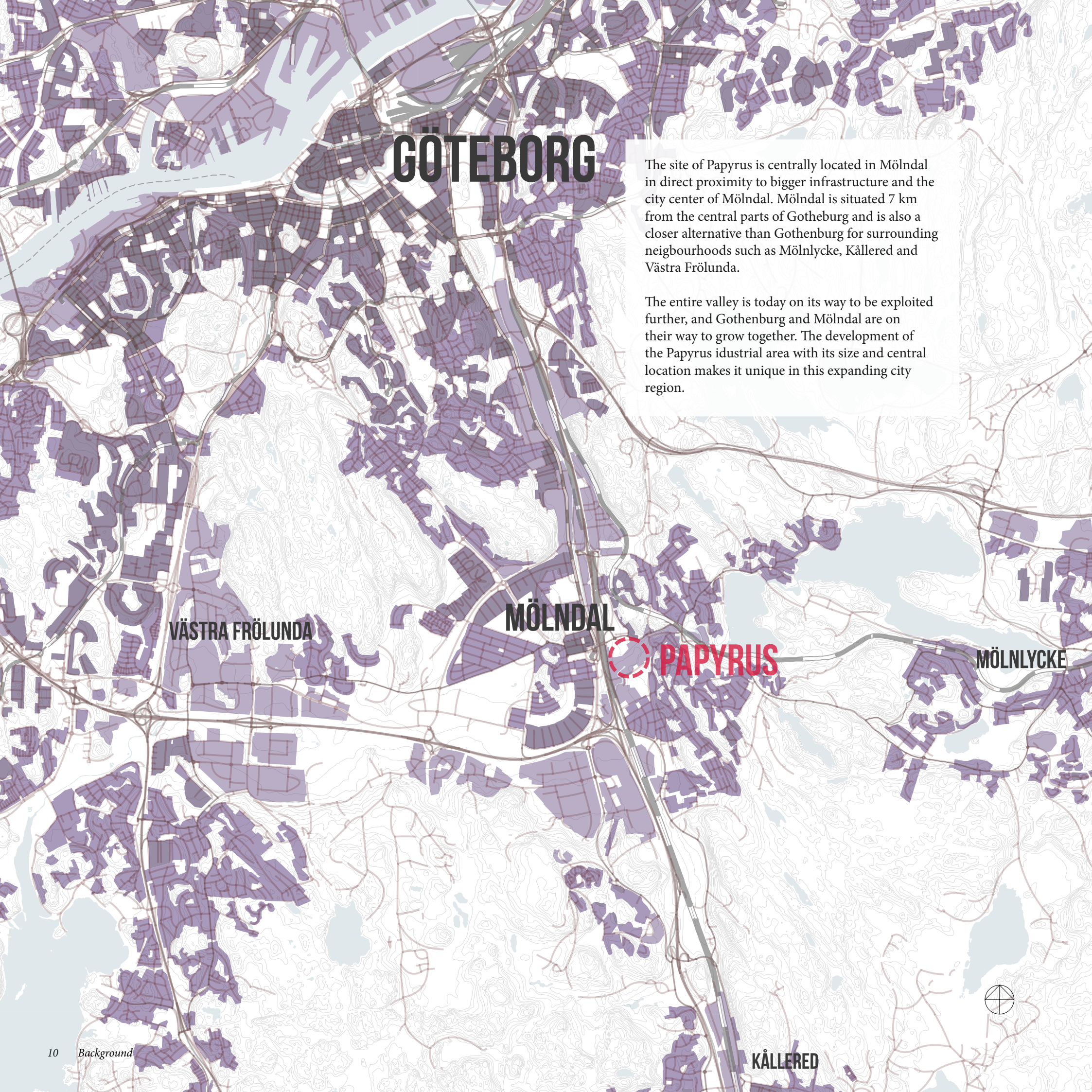
INTRODUCTION

In this work an adapted strategy for re-use and transformation, of a building at the site of Papyrus, is prsented. It is made with focus on a specific building that can become a central place and catalyst for the development of this entire new part of Mölndal. Building 10, with a shape that strongly reflects its former function, will regain life and capacity in the new society.

The city of Mölndal, through Mölndala Fastighets AB, is today working with the transformation of the whole site of Papyrus. This work lies as a background and gives us some conditions for the city developement around building 10. This is a way to anchor the project in a future urban context.

The city of Mölndal, together with the rest of the region around Gothenburg, is in a state of developement where the population and cities are growing. The different cultural and social changes lay the foundation for the needs of new functions in the city.

01 BACKGROUND



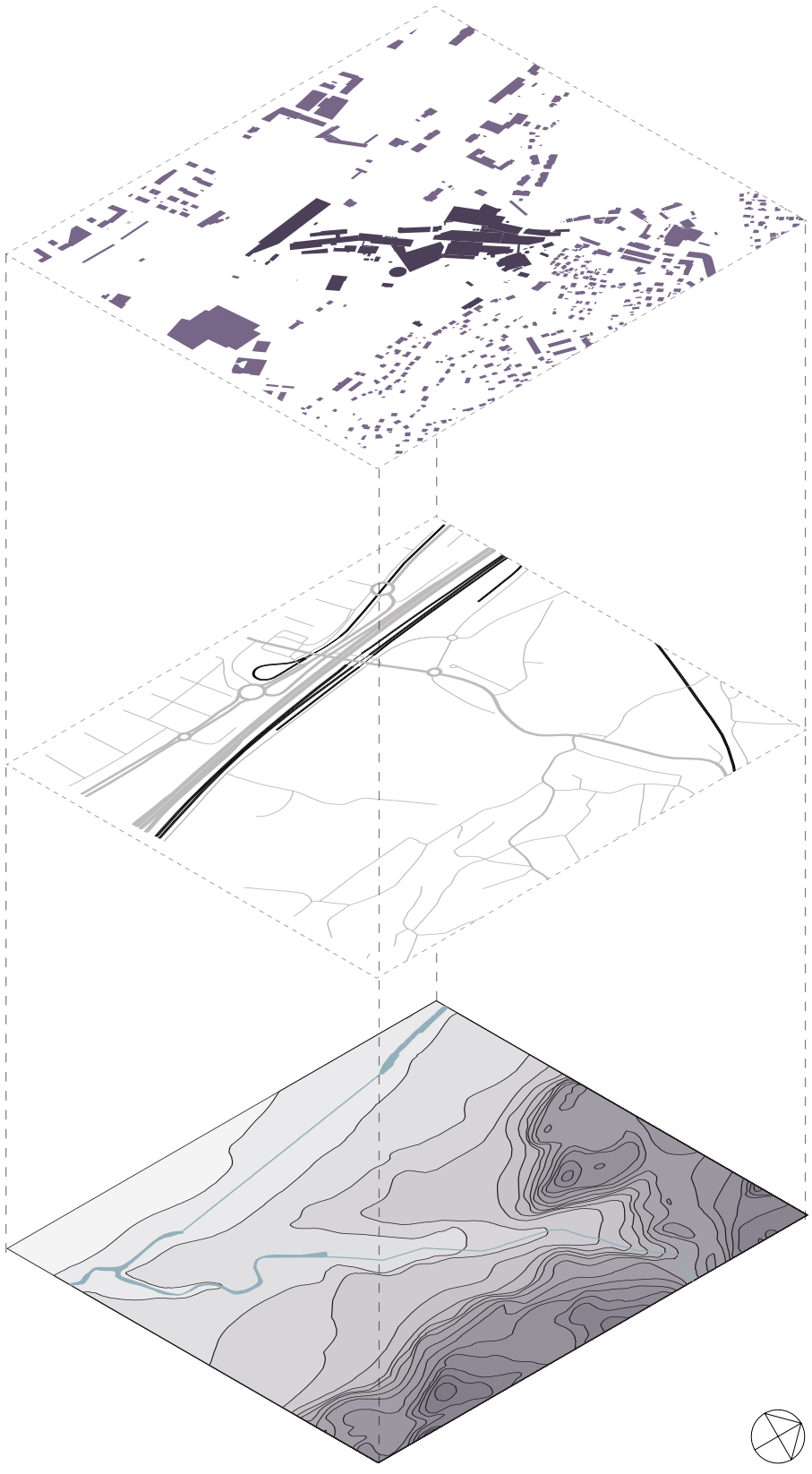
The site of Papyrus is centrally located in Mölndal in direct proximity to bigger infrastructure and the city center of Mölndal. Mölndal is situated 7 km from the central parts of Gotheburg and is also a closer alternative than Gothenburg for surrounding neigbourhoods such as Mölnlycke, Kållered and Västra Frölunda.

The entire valley is today on its way to be exploited further, and Gothenburg and Mölndal are on their way to grow together. The development of the Papyrus idustrial area with its size and central location makes it unique in this expanding city region.

The site of the old industrial area is today, as before, closed to the public. The consequence of its large area is a big barrier between the centre of Mölndal and Kvarnbyn, the historical center of Mölndal. The existing building structure on the site uses big footprints but stay relatively low in height.

When the area will be open it creates the opportunity to extend the city center and link the old and new Mölndal together. To make this work, additional ways to cross the big infrastructural area are essential.

01-1 SITE



BUILDINGS

The site consists of factories that have been built, rebuilt and refurbished since the end of the 17th century. It shows an example of a puzzle of different materials, volumes and building heights. The concentration of the whole area along the river, and later also along the rails, explain the different angles and directions of the buildings. All the gradually built-on volumes and transformations make the spaces really wide and deep and many of the original facades have been reworked and have been given an expression that reflects a variegation in the architecture.

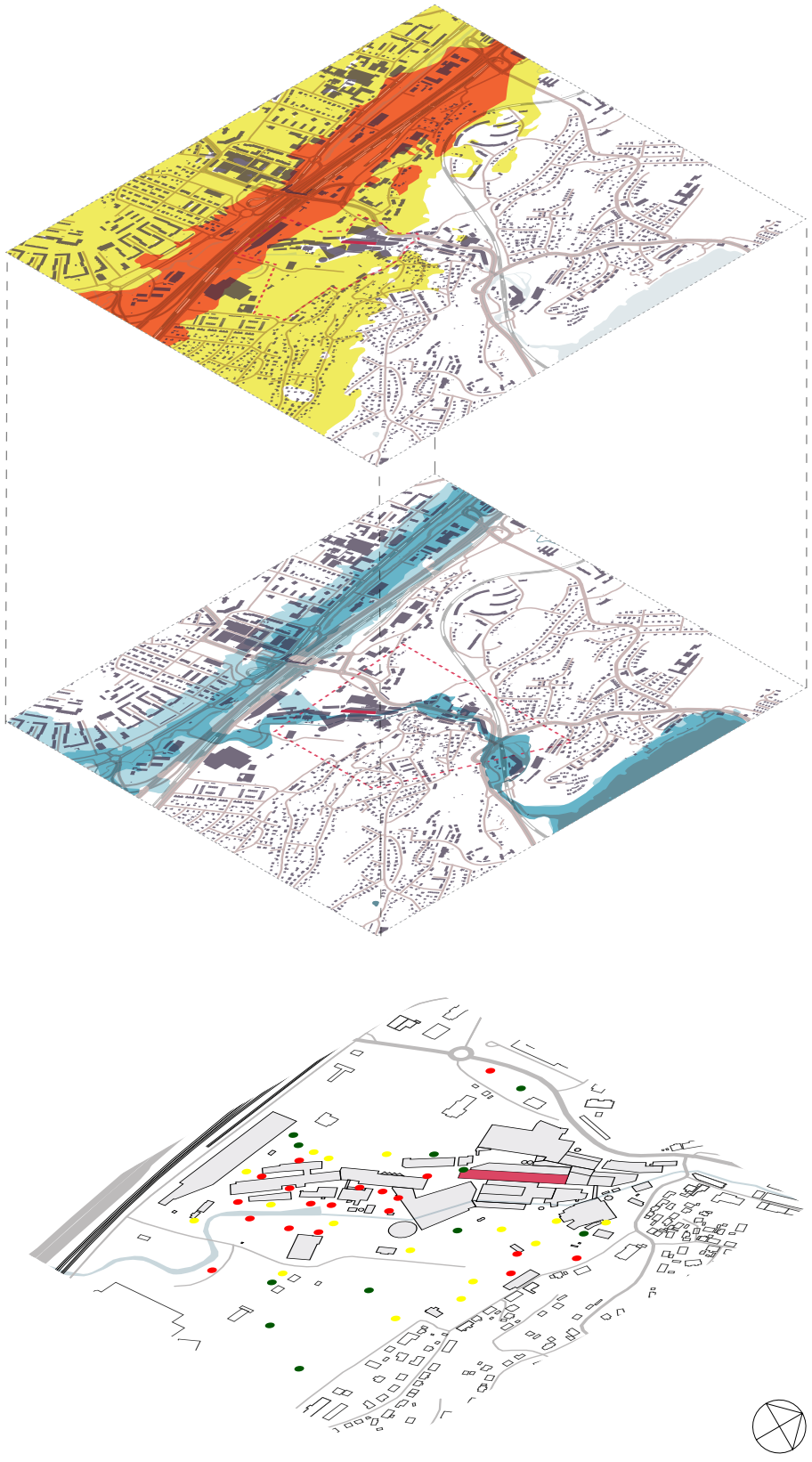
INFRASTRUCTURE

The area lies in direct connection to a big infrastructural area consisting of Göteborgsvägen, highway E6, the railway and Nämndemansgatan. Mölndalsbron is situated to the north of the area, a big connection point for public transport. Pixbovägen is running from here that also is highly trafficed by commuters. Noise and dangerous goods could be risks in the exploitation of the Papyrus area.

TOPOGRAPHY

5 meter intervals

Historically seen this has been a more hilly terrain than it is today. The river fall in Mölndal was an energy source for many mills but since the foundation of Papyrus much of the original ground and soil have been excavated or filled. The place is thus quite planar compared to how it once was.



NOISE

- > 65dBA
- > 55dBA

Because of the proximity to the highway there is a risk for high noise levels in the area. The map shows where the noise reaches above 65 dBA in red and 55 dBA in yellow.

The parts closest to the highway reach levels above 65 dBA and some parts further east have levels above 55 dBA, but building 10 is situated in a way so that it is protected from the higher noise level.

The site has to be protected from this if it is to be built on. It is planned to be solved with higher office buildings and parking garages closest to the highway.

FLOODING

- Highest level today
- 100 years scenario

The valley and the area around Mölndal is threatened by relatively high risk of flooding. There are two different scenarios; highest possible flooding levels today and a flooding scenario in 100 yeras with sea and land rise taken into acount.

Papyrus is situated in a place where there are insecure risks of flooding. Because the river runs through the area in combination with a lower terrain and hard surfaces we assume that there is a high risk in both cases. This is something that has to be considered and while developing the area. There is for example a suggestion of introducing a water power station to be able to produce local energy and control the water levels.

CONTAMINATION

- Under KM
- Over KM
- Over MKM

The site contains a lot of contamination that exceeds KM (sensitive landsuse, housing) and also MKM (less sensitive landuse, other developments) in alifates, aromatics, PAH and heavy metals in the soil. The groundwater holds relativly low levels. The existing top soil layer consists mostly of filling masses of gravel, sand, mud, and slag with parts of brick, wood, metal, porseline and more.

The contamination levels are higher in the built parts of the fomer industrial area. In the south east garden the levels are under KM except for two testing points. The testing point taken closest to building 10 are under KM.

This project is limited to a smaller part of the area and more specificly to one building called building 10. It was one of the first buildings on the site and is very centrally situated in relation to the rest of the constructions. Its elongated shape reflects well its former function as paper machine hall and captures the direction that can link the older and newer parts of Mölndal together.

01-1 CURRENT BUILDING FUNCTIONS

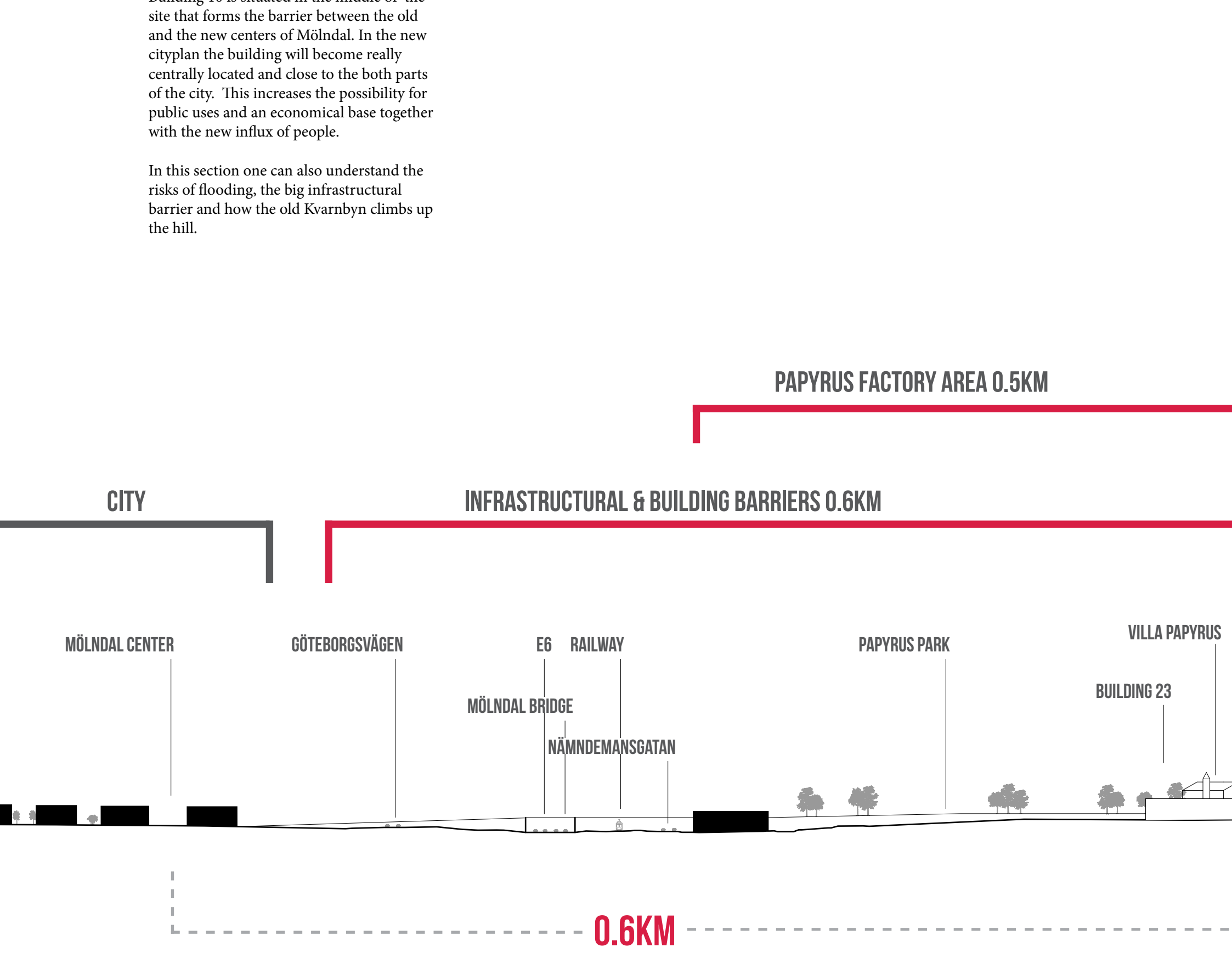
Today only few of the former factory premises are used. There are however some activities like Lim & Handtryck AB and Kvarnbyns hand paper mill that reminiss of the functions that once existed here. These direct connections to the production of paper make them intresting to preserve.

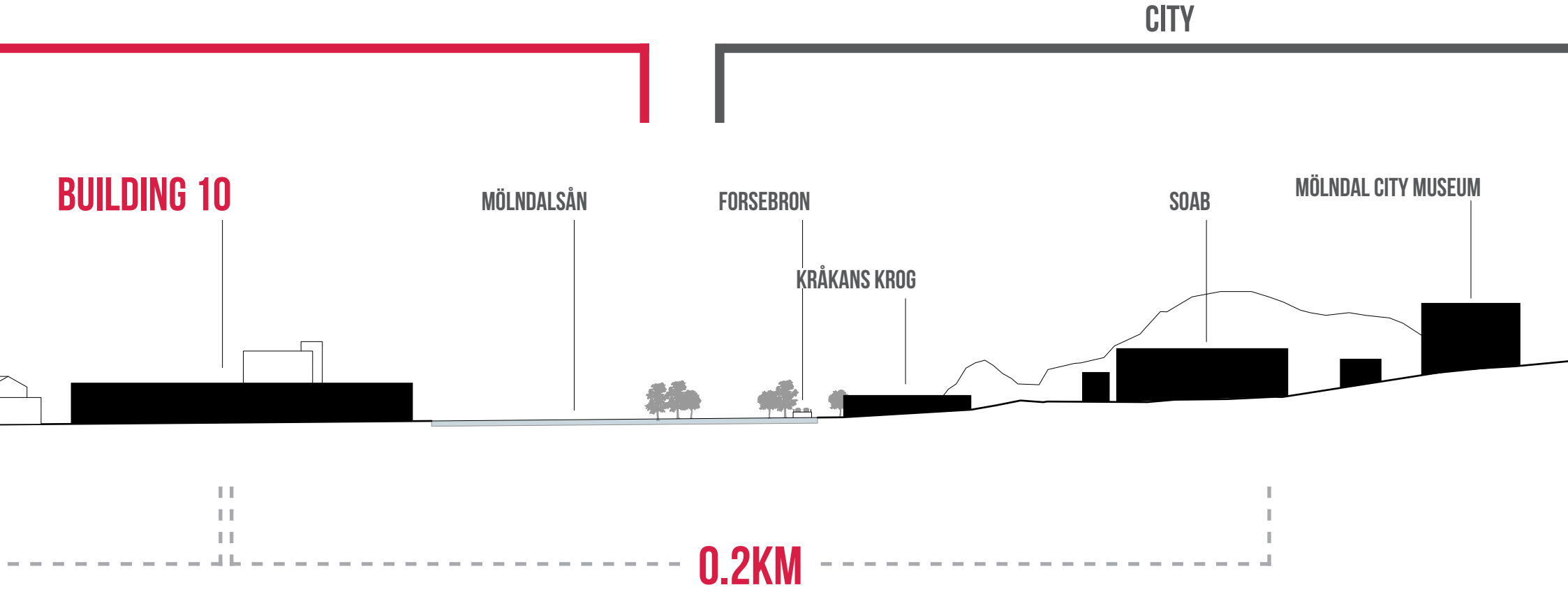
The comprehensive decay of many buildings of course influences the technical state of the buildings that quickly have deteriorated to different extents.

01-1 SCHEMATIC LONGITUDINAL SECTION

Building 10 is situated in the middle of the site that forms the barrier between the old and the new centers of Mölndal. In the new cityplan the building will become really centrally located and close to the both parts of the city. This increases the possibility for public uses and an economical base together with the new influx of people.

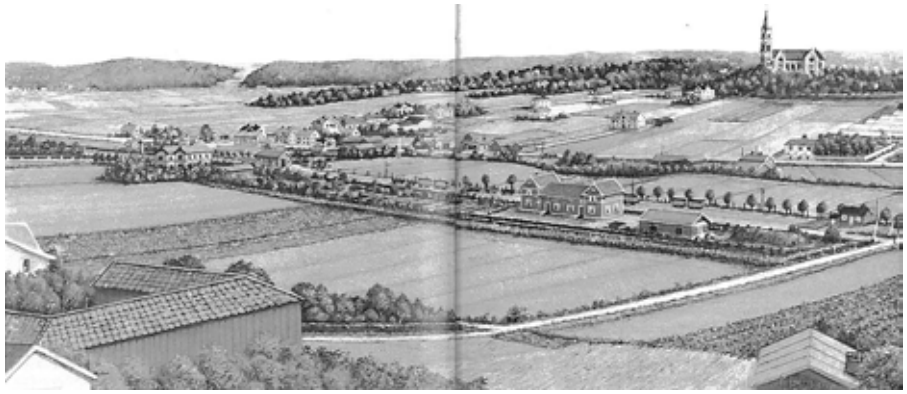
In this section one can also understand the risks of flooding, the big infrastructural barrier and how the old Kvarnbyn climbs up the hill.




CITY
BUILDING 10
MÖLNDALSÅN
FORSEBRON
KRÅKANS KROG
SOAB
MÖLNDAL CITY MUSEUM
0.2KM
1:2000
100 M

01-1 SITE PHOTOS

01-1 MÖLNDAL & THE INDUSTRY



Part of Fässebergs Socken 1910. Painting by Knut Berg.

Map of Mölndal 1922.

Map of Mölndal 1957.

Mölndal is a society that has grown from its industries. Early they started using the power in the falls of the river and around this water power the city has developed. In the beginning, Mölndal was an agricultural society which also shows in the name. Mölna means water mill and these mills were concentrated around the river where they ground seeds into flour for the neighbouring districts (Krus, 2007).

When Sweden was industrialized in the end of the 19th century and the beginning of the 20th century, the placement of the factories was of great importance and gave different conditions. When close to the city the advantage was the proximity to clients and work force, but one was limited by the lack of space. One was also dependent on the steam power and later on the electricity. When located on the country side which was the case when Mölndal was industrialized, the great assets of buildable land, water power and raw materials were close at hand. Instead there was a lack of work force and social services. Therefore these industries often formed the societies and in many cases had strong features of paternalism (Brunnström, 1990). In Mölndal this becomes really clear in the end of the 19th century when D.O. Francke developed Rosendahls Fabrikers AB and has a big influence and power over the municipal politics (Gahrn, 1990). In the maps and pictures to the left one can see how the industries spread at the same time as the city was built up. The industrialization during the early 20th century has been steering the whole development of Mölndal. Together with the expansion of the factories along the river and Kvarnbyn the city center of Mölndal has been moving all the time and finally ended up at the other side of, what is today, the Mölndal bridge. Later on, new industries have continued to grow around the infrastructural paths that lead to Gothenburg (Jörnmark, 2008).

The emergence of the factories of Papyrus has affected Mölndal as a society during decades and many people have a personal relation to the area and its history. It has been the place where the youths were working during summer and has occupied the citiizens of Mölndal for many years. This is an important aspect to take into acount in the developement of the site. By highlighting this history, the new negihbourhood can be given both a strong identity and genuineness.

01-1 A DIVE THROUGH THE PAPER MILL'S HISTORY

1653
The first paper mill is founded in Mölndal by Thomas Kuhn, the mill is closed down when the same man dies.

1736
Esbjörn Schiller sets up a paper mill in Mölndal. He gets sole right in collecting linen rags (the raw material for paper) in Halland but finally needs to import the material anyway. The mill becomes the biggest in Sweden.

1758
Georg Lange starts up a paper mill and competes with Schiller about the linen rags.

1792
Samuel Norberg takes over Schillers mill and later on also buys Langes Paper mill. It is now called Korndals paper mill.

1827
The mill has been sold and an oil factory is installed in the facilities. A new hand paper factory is founded that is called Götafors.

1855
Korndal has bought two more mills and is now the biggest paper mill in Sweden.

1873
David Otto Francke forms Rosendahls fabrikers AB and buys all mills below Forsebron.

1879
D.O. Francke goes bankrupt and many irregularities are revealed in the bankruptcy investigation.

1880'S
Because of neglected maintenance many deaths and severe accidents occur in the work place.

1892
Francke's estate and Korndals AB goes bankrupt. The practice could not continue which led to high unemployment rates in Mölndal. For the first time since the 1730s no paper was produced in Mölndal.

1895
Marcus Wallenberg founds AB Papyrus.

1897
The production of paper starts once again.

1900
Papyrus receives a gold medal for its colored and patterned papers at the world exhibition in Paris.

1907
Papyrus workers union is founded and grows strong. The union became a "nursery" for competent local politicians.

1900'S
Papyrus acquires several kinds of affiliated companies to give the factory what it needs for the production. Electricity, ground wood pulp, sulfite, magnefite and pulpwood.

1917
AB Mölndal is created to administer Papyrus' forests and some properties. Papyrus is co-owner of several groundwood mills from which they acquire groundwood for the production.

1945
The 50th anniversary of Papyrus is celebrated and the anniversary issue "1895-1945, On rich traditions" is printed.

1950
From the 50s until the mid 60s it was hard to find labor for the factory in contrast to the 30s when people were queuing to get a place in the factory.

1968
Railways are drawn to the big storage building to simplify the distribution and logistics.

1987
After advancing from oil heating to coal they now take a big environmental step and proceed with natural gas. They get hold of the country's first gas heated combined power plant. Stora Kopparbergs Bergslags AB takes over Papyrus which was the biggest business merger ever at this point in Sweden.

1990
Now there is only three main products. Macoprint (coated paper) Colorit (colored paper) and cardboard.

1998
The large company merges with the Finnish forest giant Enso and Stora Enso was formed. The mill was named Stora Enso Mölndal AB. The practice becomes a very small part of the large group.

1999
A biological wastewater treatment plant is created with bio film engineering to clean the waste water from three different production units. The trout spawns again in the river of Mölndal.

2002
Papyrus is bought by Klippan and is called Klippan AB Mölndals bruk. The amount of employees has decreased from its peak of 1200 in 1945 to 400 employees. The machines are improved and can decrease in numbers and thus the work force with it.

2003
The mill is streamlined and cut down from 12 to 2 paper machines. Now only niche products are created, Colorit.

2006
Papyrus goes bankrupt and after this many buildings stand empty for several years.

2009
The city of Mölndal buys the whole area from Stora Enso.

2011
Mölndala Fastighets AB, that originally was created by Stora Enso before selling the area, is now owned by the city of Mölndal. It is given the responsibility for planning, developing and exploiting the Papyrus area.

2014
Mölndala procures an architect to start the planning of the site. Demolitions will be starting after the summer.

1653

The first paper mill in Mölndal (left)

1736

The location of Schillers paper mill from 1736 - 1894

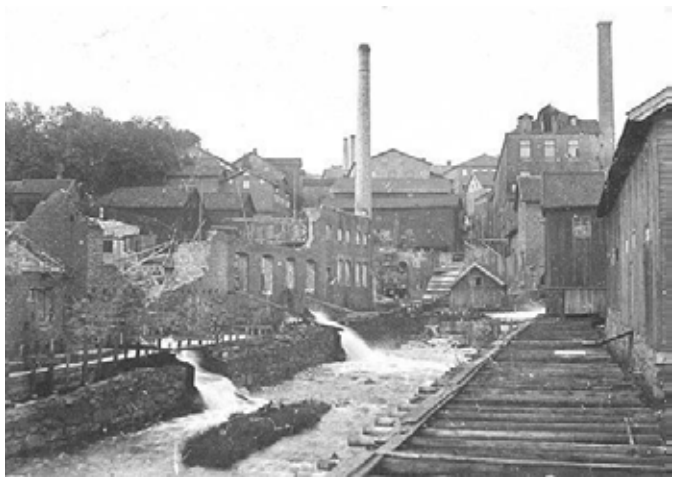
1873

Factory tag for Rosendahls Fabrikers AB

Main entrance to the factories of Papyrus

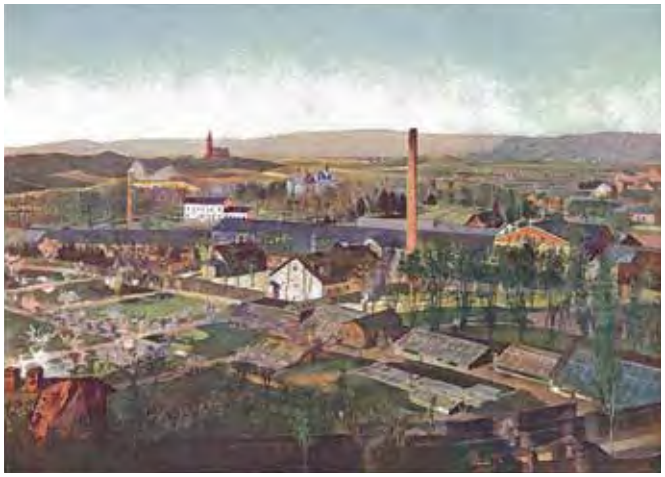
1894

The river of Mölndal north of Forsebron



1900

Papyrus first advertising brochure



1915

Letterhead from 1915

1918

Building 10

1923
The sulfite factory

1945
Paper mass machines

Aerial photo over Papyrus

1955
Bird's view over Papyrus

1956
New main entrance in functionalist style

1968
Aerial photo

2014
Part of the factory area today

1995
Photo from the river

01-1 BUILDING EVOLUTION OF PAPYRUS

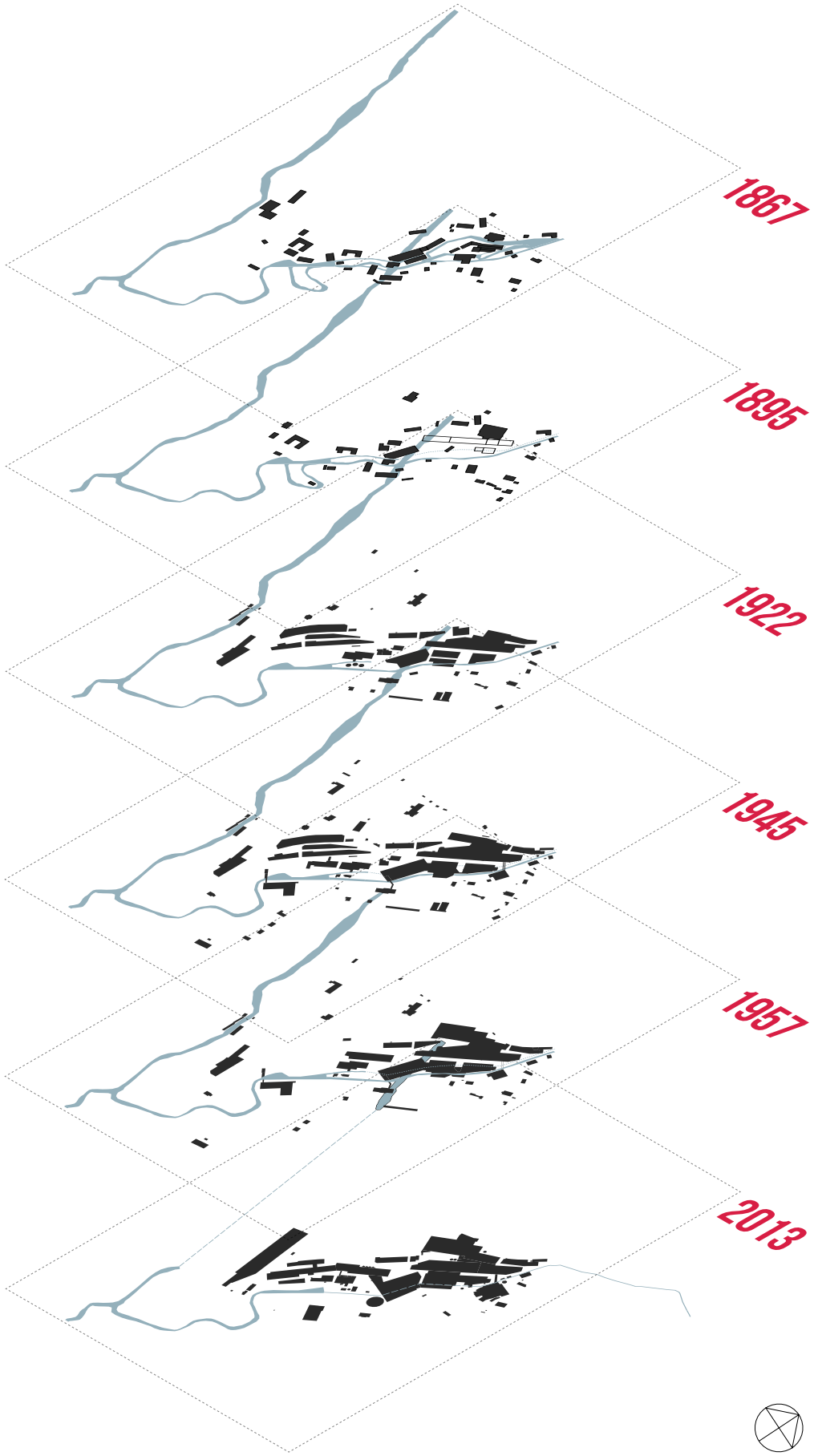
When the mill of Papyrus was founded in 1895 many of the earlier buildings from Korndahls paper mill were demolished and the functions were concentrated to the area that we see today. Before there were greenery and gardens in the area that also contained several housing buildings. The character of the area was quickly changed during early 20th century when many factories and dwellings were constructed, and several of the existing constructions went through modernisations and refurbishments. Like similar industrial architecture from this time, mainly the American, Papyrus' buildings were characterized by a restrained architecture in brick.

In the same speed as the production increased the area was changed by rebuilding, extensions and new constructions. Between 1920 and 1950 there was, for example, a larger storage and workshop built at the same time as older buildings such as the acid house and boiler house were torn down to make space for new building functions.

Since the 1940s the plant is characterized by a large scale where new factories became bigger and with a modernistic approach. Also extensions and reconstructions were made simple in their expressions and mostly in white plaster.

After some demolitions during the 1960s several bigger volumes were added and the river of Mölndal was covered to a large extent. Since this time the area has kept its footprint. Buildings have gone through some minor changes but no larger new constructions were made, mostly because the production was rationalized and streamlined.

The long developement derived from function, where the buildings always have been adapted to new conditions, lays the foundation for how one could once more adapt and give the buildings new functions in the new neighborhood that is coming to grow here.



Before Papyrus was founded there was the Paper mill of Korndal and later Rosendahls fabrikers AB on the same site. One can see the more natural state of the river that was more like a kind of delta with all the different streams.

Papyrus was founded and new factories were built along the river that also is modified to give greater flows, the first step towards an increased risk of flooding.

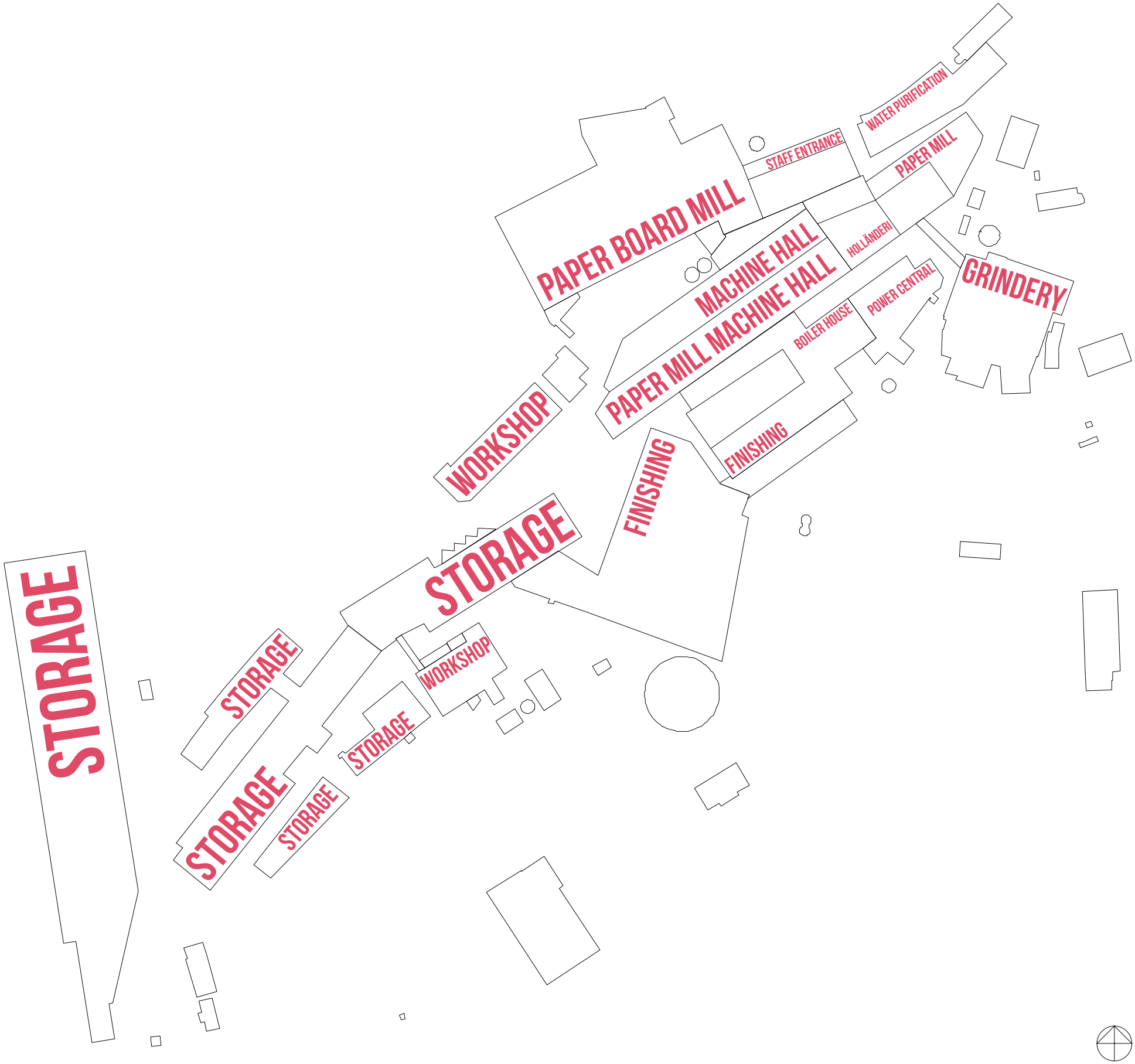
The industry was growing fast and several buildings were extended and converted. One can see how the structures were adapted both to the river and the rails that ran through the area.

Until the middle of the 20th century more new constructions were built as the production increased.

Big parts were rebuilt because of changed functional requirements, for example the whole storage part was changed when they changed from railway transport to truck transport.

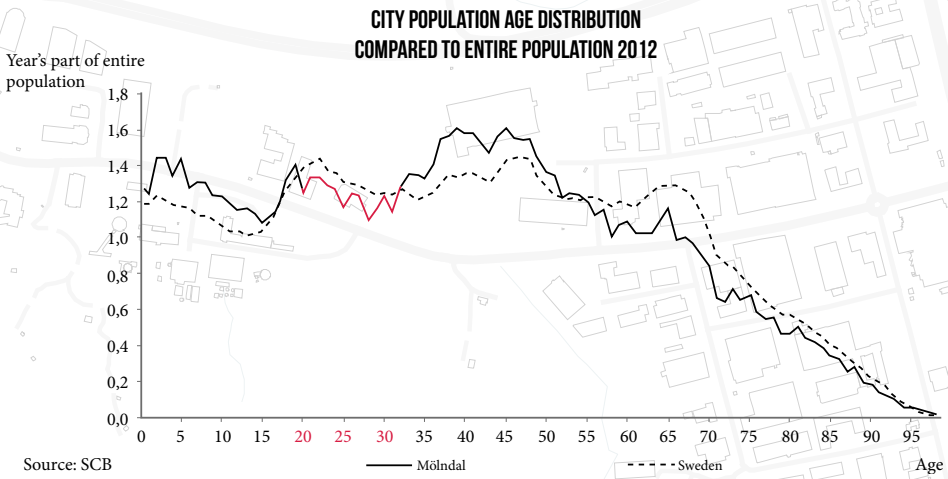
From the 1960s there was more or less no new constructions made except from extensions and reconstructions of existing structures. Both functional and production conditions were changed. Longer parts of the river today runs through a canal or is in culvert.

01-1 BUILDING FUNCTIONS OF PAPYRUS



01-1 ACTIVITIES IN MÖLNDAL

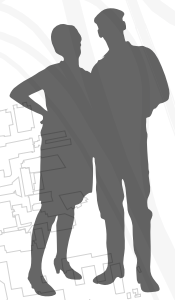
ODLINGSLOTTER
AKTIVITETSCENTRUM
ANNEXET
KULTURHUSET MÖLLAN
STADSHUSET
STADSMUSEET
KULTURSKOLAN
AKTIVITETEN
BIBLIOTEKSLABBET
ÅBY TRAVBANA
BROSLÄTTSGÅRDEN
ÅBY BADMINTONHALL
BROSLÄTTS NÄRIDROTTSPLATS
FRIDROTTSARENAN
ÅBYBADET
ÅBY ISHALL
TENNISHALLEN



Source: SCB

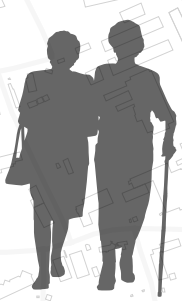
CHILDREN & TEENAGERS

Playgrounds, the youth centre, football fields and sport facilities are some examples of acivities that are offered to children and youths in the city. The museum and Möllan offeres workshops and other events for children and families. The culture school is open for everyne between 0 and 19 years old.



YOUNG ADULTS

Except for the sport facilities there are basically no activities that directly appeal to young adults. Mölndal that is in a developing process with many people moving here, misses possibilities for commitments and creative developements among the young adults that instead tend to move from the city.



ELDERLY

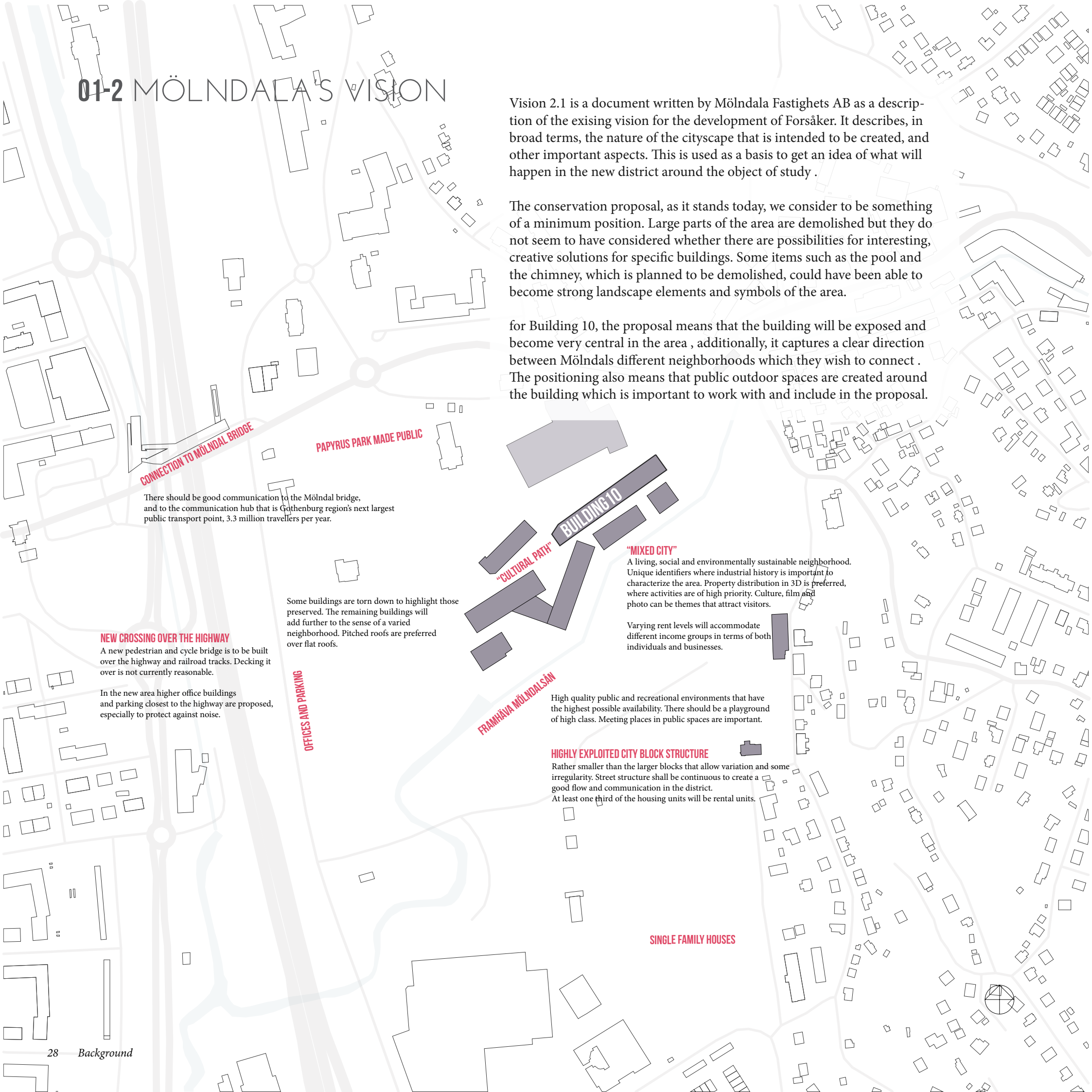
The elderly inhabitants are offered miscellanous activities from yoga and gymnastics to granny's embroidery and old men's clubs.

01-2 MÖLNDALA'S VISION

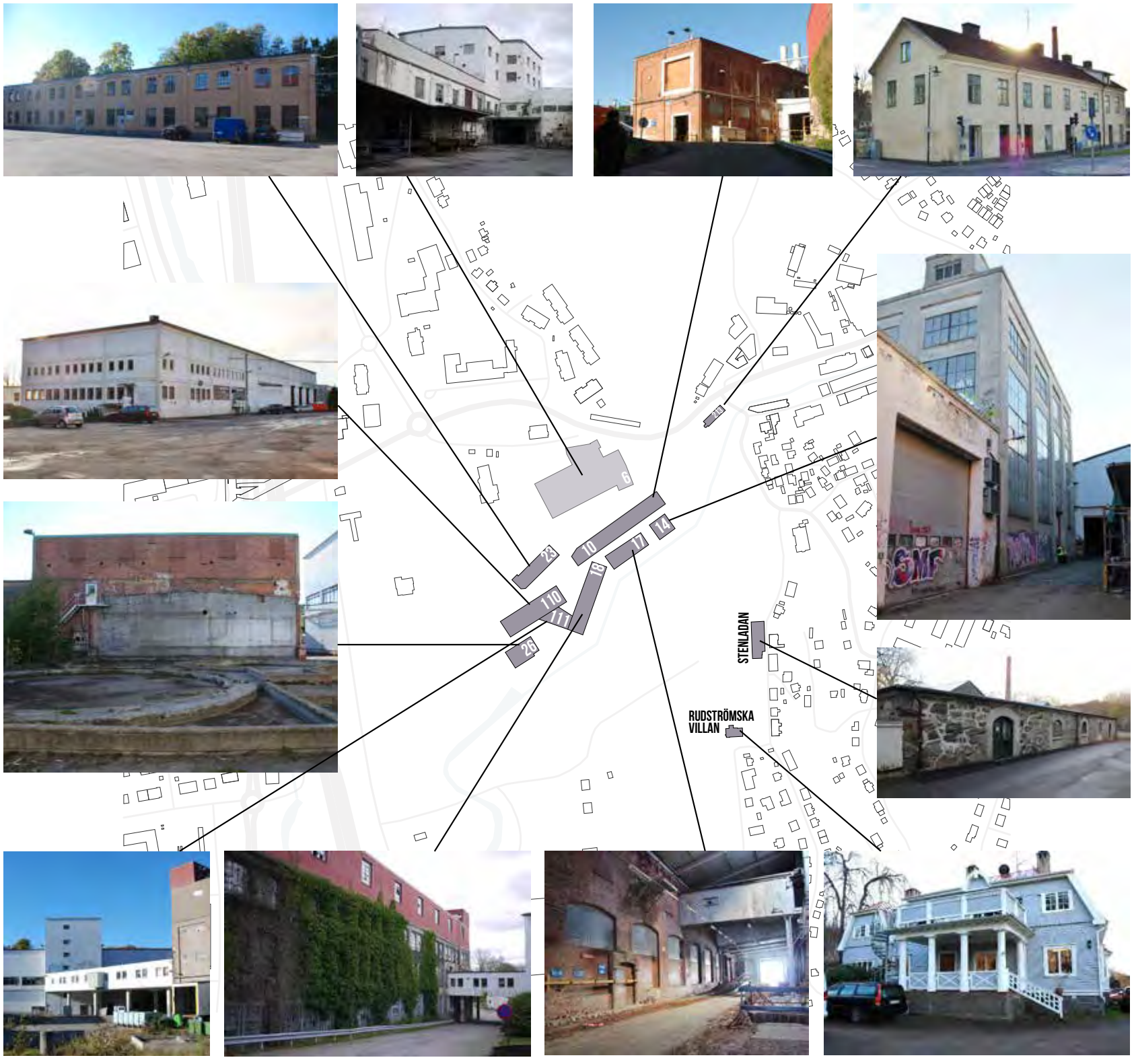
Vision 2.1 is a document written by Mölndala Fastighets AB as a description of the exising vision for the development of Forsåker. It describes, in broad terms, the nature of the cityscape that is intended to be created, and other important aspects. This is used as a basis to get an idea of what will happen in the new district around the object of study .

The conservation proposal, as it stands today, we consider to be something of a minimum position. Large parts of the area are demolished but they do not seem to have considered whether there are possibilities for interesting, creative solutions for specific buildings. Some items such as the pool and the chimney, which is planned to be demolished, could have been able to become strong landscape elements and symbols of the area.

for Building 10, the proposal means that the building will be exposed and become very central in the area , additionally, it captures a clear direction between Mölndals different neighborhoods which they wish to connect . The positioning also means that public outdoor spaces are created around the building which is important to work with and include in the proposal.



01-2 MÖLNDALA'S PRESERVATION PROPOSAL



PRESERVE

VOLUME RECREATED WITH NEW BUILDINGS

01-2 EXTENDED GENERAL PLAN

In November 2013 an extended general plan for the valley of Mölndal was presented by Mölndal and Gothenburg in co-operation. There are guidelines for the development of the valley towards a more city like character and the Papyrus area is a big part of this development in Mölndal. The document points out how Papyrus will be given a city like mixed use character with a high exploitation.

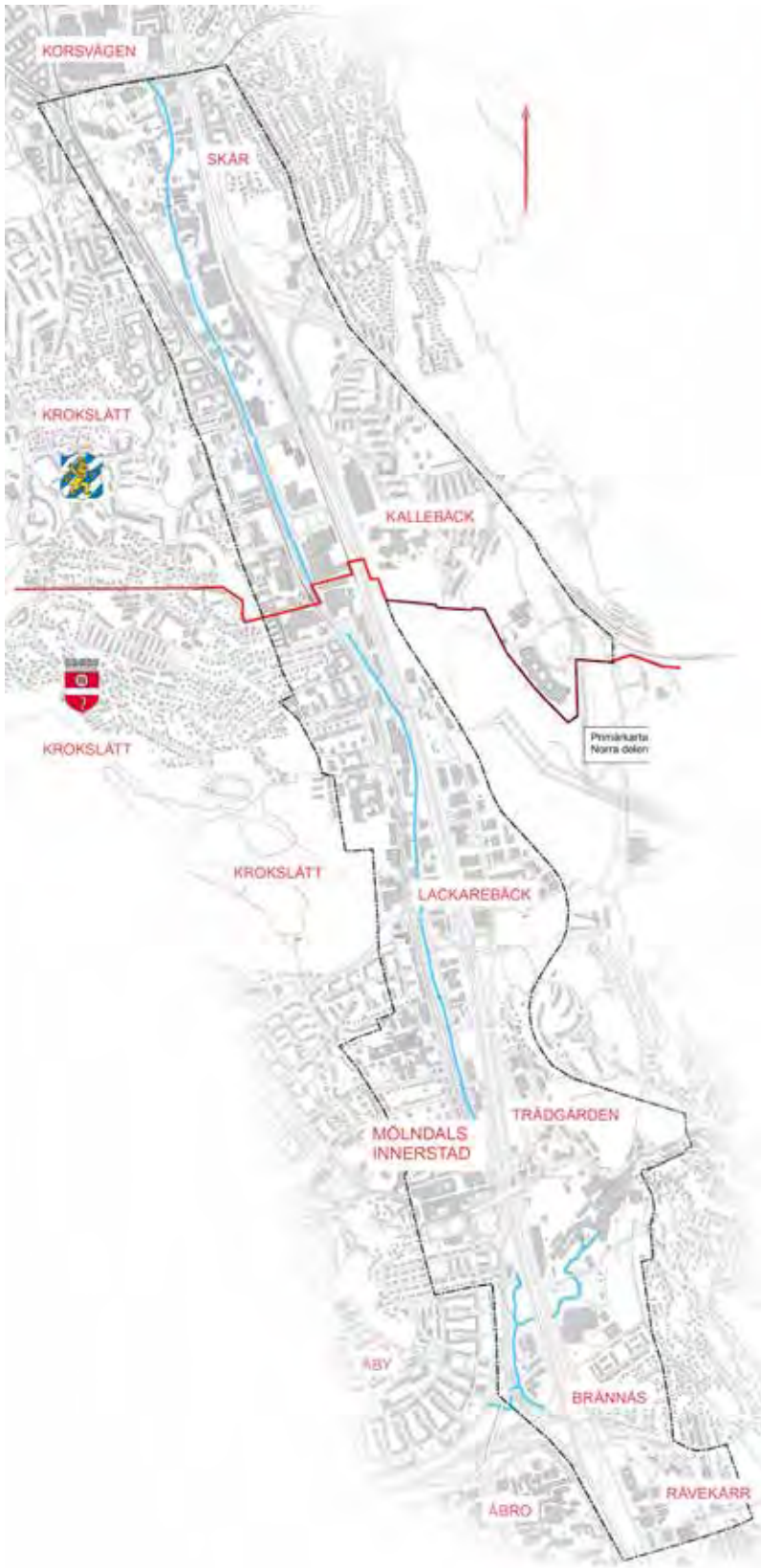
The demand for industrial land in the area has decreased and instead there is an inquiry for a more dense urbanization with housing, commerce and offices. At the same time that there is a higher demand from the market, it is however hard to achieve a good environment for living because of the traffic. Both noise and dangerous goods have to be taken into account in the planning.

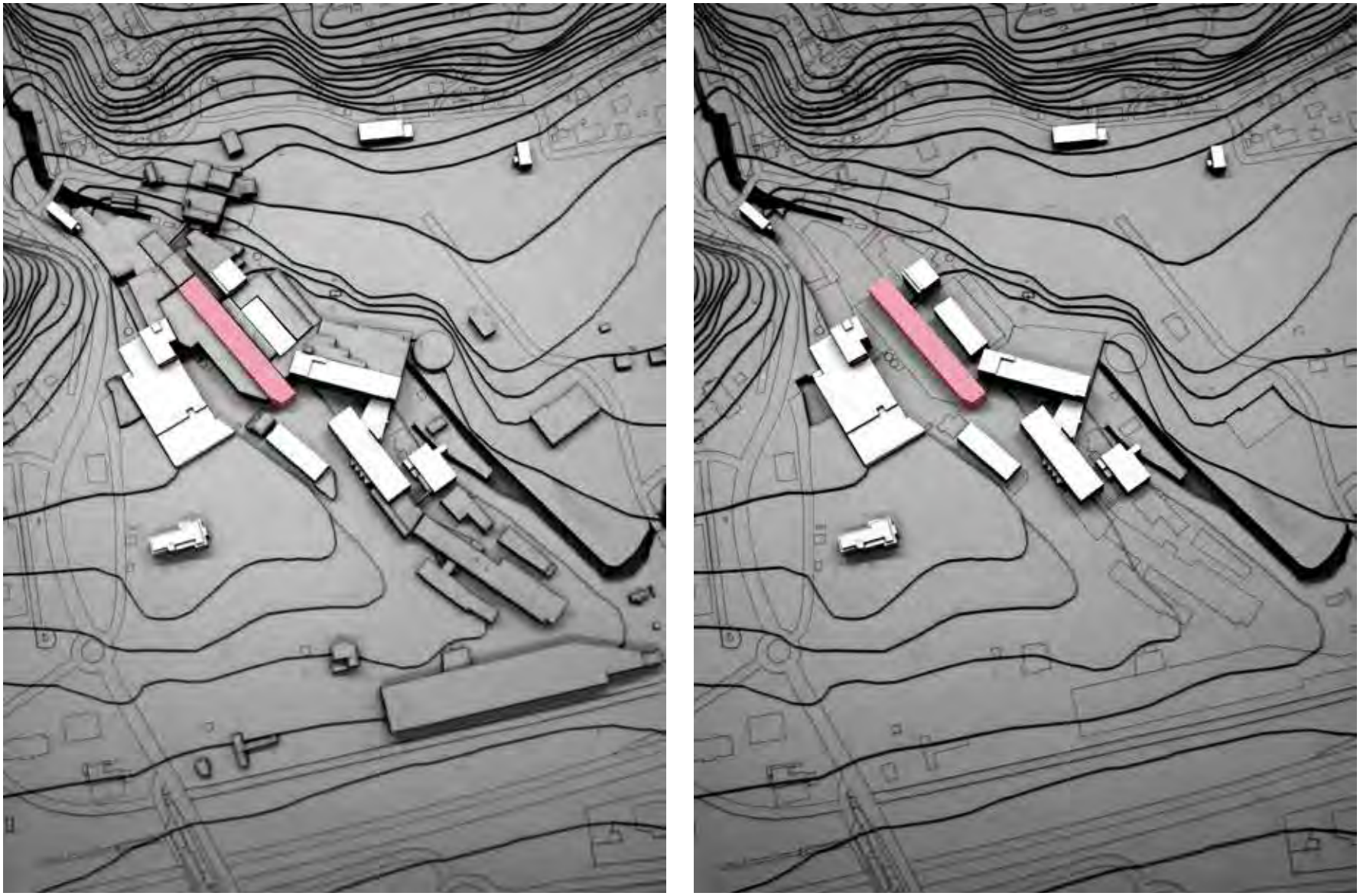
Along the entire river there are industries of different character from which many are mentioned as worth preserving from a cultural and historical point of view. There is a wish for the whole area to develop into a neighborhood with its own strong identity, where the old industrial buildings can be emphasized in the urban area, and main streets will have active ground floors. The river of Mölndal is also an important element along which they want to organize walking paths, more crossings and seating. At the same time it is important to consider the flooding risk and preserve the rich flora and fauna along the water (Göteborgs och Mölndals stad, 2013).

The Papyrus area goes under the definition R8, which doesn't protect the buildings in the same way as a national interest which is implemented in Kvarnbyn, but it constitutes a recommendation. In the end, it is the detail plan that will be the governing document. In the recommendations for Papyrus it's written: "extensions and reconstructions and other changes should be performed with care, so that the urban character is preserved. Proportions, materials, colors and windows are significant parts." (Krus, 2000)

From "R8 Area of cultural and historical value": "General recommendations apply mutatis mutandis. Restrictiveness should be exercised against new developments that counteract the cultural interests. Extensions and reconstructions that doesn't defeat this purpose may be allowed. At the general suitability assessment, special consideration should be given to the area's heritage values. Recommendations for the buildings in the historic preservation program are to be followed. " (Göteborgs och Mölndals stad, 2013)

To the area of Papyrus there are new transports desired in the form of a new connecting road from Mölndal center to the area south of Mölndal bridge, and also from Kvarnbyn to the Papyrus area in the northeast. This makes building 10 a very central building in the area, and its elongated shape creates a clear direction from Mölndal center to Kvarnbyn. In addition, they want to add a walking and cycling route from north to south through the area, making the space in front of building 10 to an intersection, and meeting point (Göteborgs och Mölndals stad, 2013).





Buildings that are preserved in white, building 10 highlighted.

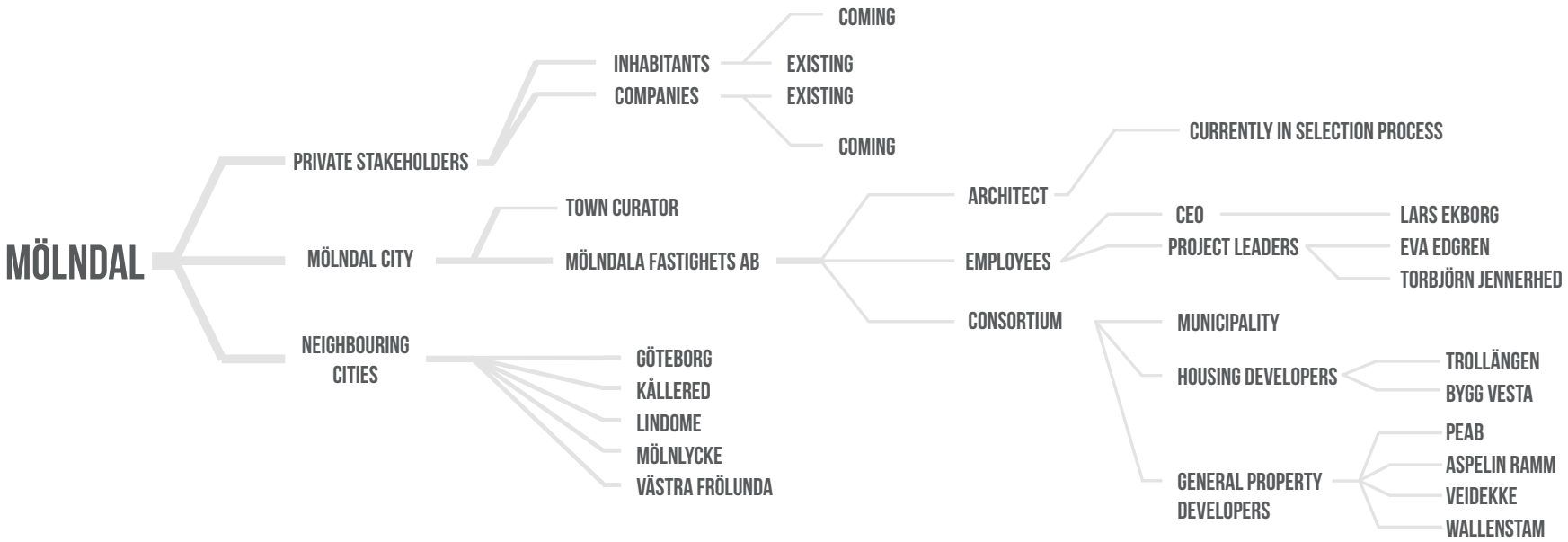
Model photo of how the industrial area is today, building 10 highlighted. Other buildings outside the industrial area and infrastructure are engraved.

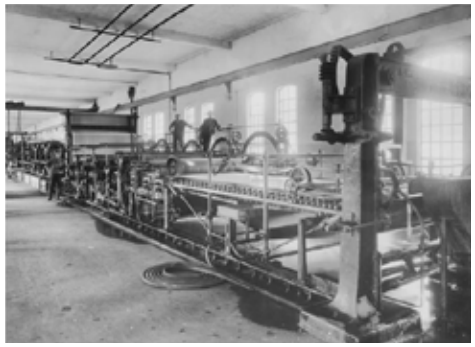
Model photo of preservation proposal, building 10 highlighted. Other buildings outside the industrial area and infrastructure are engraved.

01-2 PROJECT PARTIES

The city transformation project is currently run by Mölndala Fastighets AB and a working group with a number of contractors in a consortium. The architect that will design the city plan is currently being selected after having received several different proposals. The city of Mölndal is involving the town curator in the process to observe the development.

The arrangement with a consortium consisting of some of our well-known building contractors has both pros and cons. The biggest problem is that it is primarily economic interests in focus, rather than a desire for a development where creative solutions arise. They work according to existing models and approaches.





01-3 BUILDING 10 HISTORY

Building 10 was constructed in 1896 as a paper machine room, hence the elongated shape. It was built in conjunction with the foundation of Papyrus and is one of the very first buildings on the site. FO Petersson, who built many of the area's first factories, was the contractor. The building of factories in Sweden was at the time, around the turn of the century, at its peak and the amount of employees in the industries more than tripled between 1890 and 1910 (Brunnström, 1990).

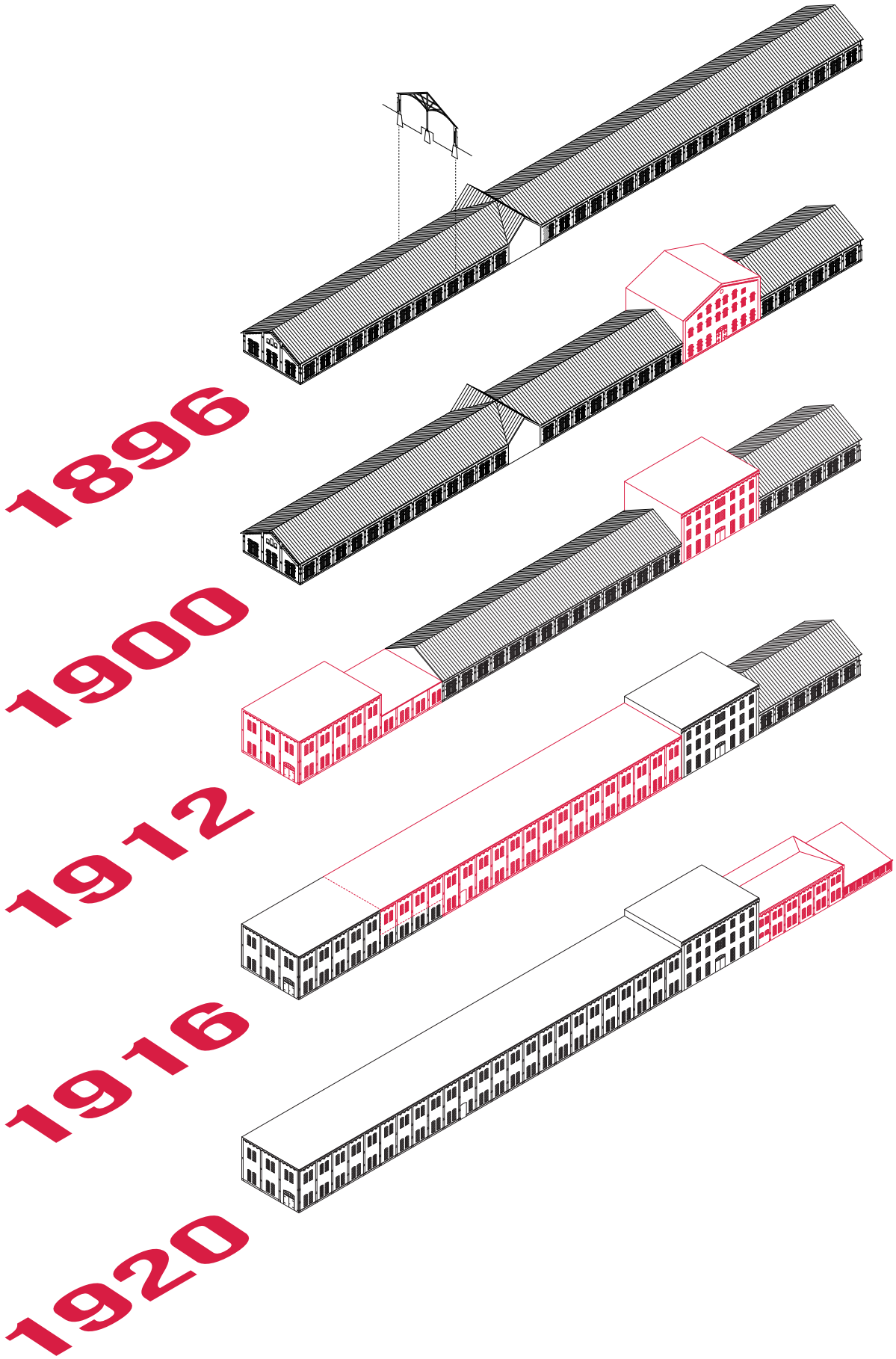
In 1896, the building was constructed in brick; one level on a low plinth of natural stone and a pitched roof. Towards the middle there was a smaller transverse building volume. Paned windows were placed in pairs between buttresses in regular sections. Decorations consisted mainly of a bricked cornice and decorations around the windows. The original building had a different functional division than today.

During the 1900s the building has undergone several changes. Early extended with what is now building 4 (Holländeriet) with a transverse gable roof. During the second decade the entire building was extended with one more level with a flat roof, and was given the expression of this time's rational factories. The new facade was consistent with the existing one, with equal window pairs and an extension of the buttresses.

Building 4 was modernized after a fire and became three stories high, still consistent with the existing building 10 but without buttresses. Building 2, northeast of building 4 and also used as a machine hall, went on to become a two-storey building in the same style as building 10.

In 1929 building 10 was extended and got its present gable to the southwest, all in the same design as the existing building with large arched windows. The angled corner is an adaptation to the nearby train tracks that ran by the building (Lindholm restaurering, 2014).

01-3 BUILDING 10 EVOLUTION



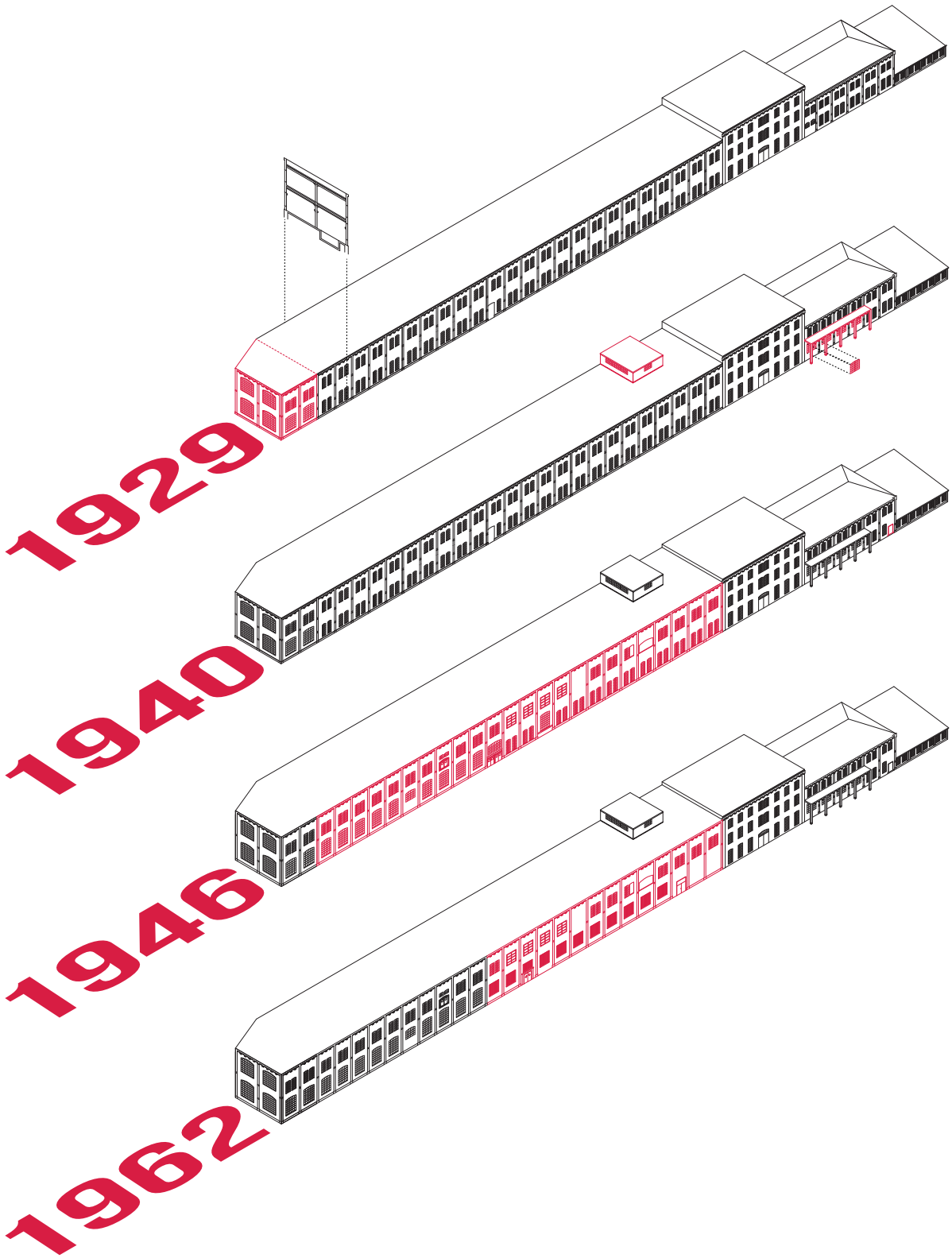
The building is constructed as a paper machine hall, function-driven appearance but with some decorative elements around the windows and along the roof.

The building soon gets its first addition, a holländeri which is a hall for grinding paper mass. It is a taller building with transverse gable roof. This one is called building 4.

After a fire a new holländeri is built in the same location as the previous one, this time with a more modern flat roof and three floors. The conversion of the machine hall started and come to be two stories with flat roofs.

In the middle of the second decade, the entire building was transformed with a stripped-down, strict and modern style. The windows on the upper floor are in pairs between the buttresses and on the lower floor there are single large windows.

Building 2 is rebuilt and one floor is added in the same style as building 10 and 4, although with a pitched roof.



Building 10 is extended with a new gable and a wall at an angle as an adaptation to the railroad track that runs outside.

Minor changes are made in the form of a cantilevering roof to building 2 and a smaller building on the roof of building 10. The windows on building 2 are also changed under the new roof.

Major changes are made along the facade of building 10. Several windows are replaced and one allows a variation in the shape and style of the composition. Some windows are walled due to changed functional demands of the building.

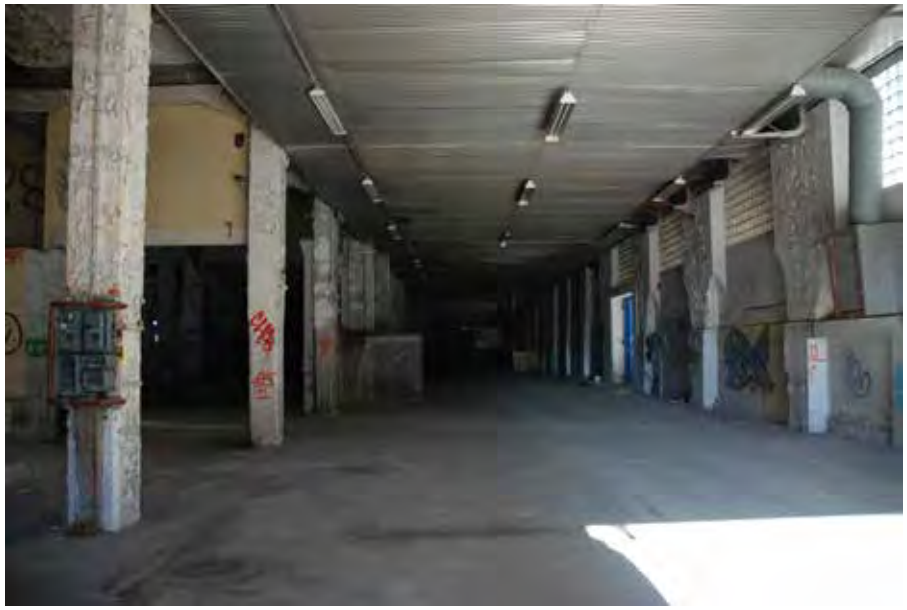
Changes of windows and walling of windows are made according to needs and one uses the technology that is contemporary at the time; at this point rectangular glass block windows.

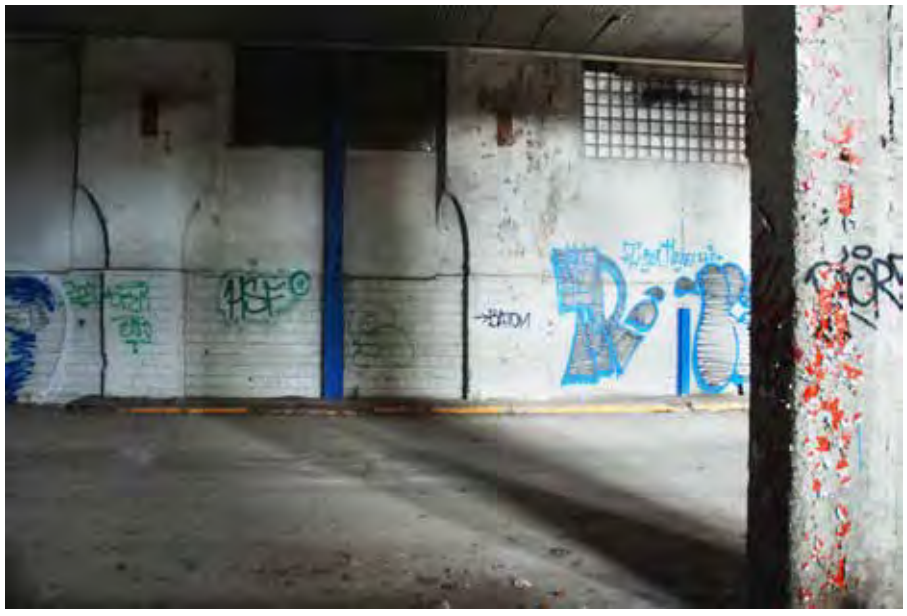
From a conservation and cultural historical perspective the most important part, considering how building 10 developed and changed, is that one actually allowed a varied style and form. Also that the changes are entirely context-sensitive, mainly when it comes to changes in the window composition. One can now see that alterations made during the latter part of the 1900s were performed with less care. This has also given the building a diverse nature where one can read and understand the history and changes of the building over a long time. It also gives more freedom in terms of openings and window compositions in the next phase of the building's life. It can be regarded as a step in the same working direction one had during the building's industrial time.

01-3 EXTERIOR

Since building 10 has changed so much over the years, it holds a lot of different expressions. Many window openings have been walled, others have been covered by metal sheets, some are older windows with steel mullions, while others have been replaced with glass blocks. The exterior of the building also have many installations attached to it. Cables and pipes are criss-crossing over, into and out of the building. In its current situation, the building doesn't have much of an exterior facade since it's built-in and built together with other surrounding structures. In essence, it is the red bricks, the different window openings and buttresses that give it its principal exterior character.

The bricks are the oldest and still most characterizing element of the building, thus an important part of preservation. Some decorations made with greater care, for example the cornice running along the top of the wall, are also of conservation interest. The parts that can withstand major changes, allowing a greater freedom, are those that can be interpreted as more irrational and with less aesthetic background. The building shape itself is very distinctive, and truly reflects its original function and becomes an important part in telling the history of the building.





01-3 INTERIOR

Once inside the building one is met by an almost completely open, elongated room. The paper machines have since long been removed but you can still see remnants of the once vibrant business in the form of old concrete foundations, railway lines, cable trays, pipes etc. On the southeast wall, the decorated pillars are still visible and the wall is split by a parapet of white tiles. The white paint and plaster are coming off the brick walls, and in some places, a deep red and turquoise color layer appear on the concrete pillars.

The elongated perspective that can be experienced has had its function, but when it comes to the next phase in the evolution of the building, it needs to be broken or limited. However, it is important to reflect elements from the previous activity to provide an understanding of the building, and to anchor the building's history in its continued life. Some elaborate details, like the bevels of the insides of the buttresses, can be something that provide fine interior qualities.

01-3 LIGHT CONDITIONS

The once light industrial building is today a rather dark and enclosed building. As the majority of the building is built-on and most of the windows are bricked up or in some cases only covered with a protective sheet, not much natural light finds its way in. However, if one would free the building from add-ons and restore the original window openings, the building would be significantly brighter and more open.

The lighting conditions today are basically unusable, but with a relative big freedom one can open up previous window openings, thus it doesn't have to be a problem. However, it will also require additional operations such as openings in the roof and floor slabs, in order to create good lighting conditions. Mainly because of the building's depth.

01-3 MATERIALITY

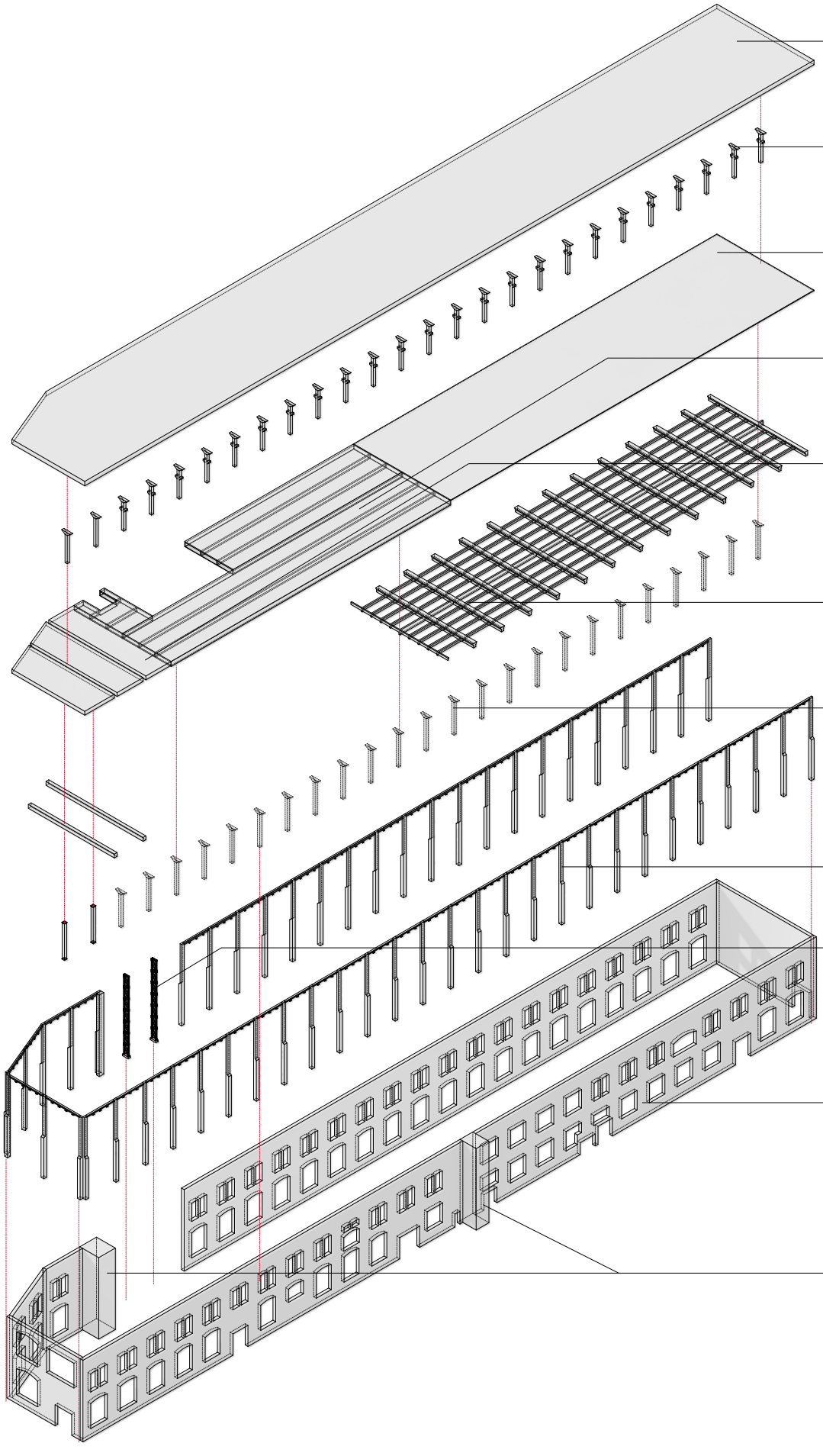
Building 10 is like a collage of different eras that all make themselves visible in their materiality. Concrete mixed with brick mixed with steel and layer upon layer of paint. The latest addition is a motley mix of graffiti, where some of it becomes quite decorative, while others are mostly perceived as vandalism. Walls have been opened up or bricked again as it has been needed. On the outer wall it's visible how one decorated the facade, partly by using bands of yellow bricks by the windows.

The materials giving the building the most character are brick and concrete that form the main load bearing structure. These naturally become materials which will constitute the major part of conservation. Details such as graffiti and cable ladders can in many cases be decorative and the building itself may be allowed to grow as a gallery of ruin romance.

01-3 STRUCTURE

The repetitive concrete structure becomes very characterizing and highlighted in the interior. In the southwestern part of the building, the floor slab has been opened up in one part and what once was the outer wall has been removed and replaced with high steel columns.

Some parts of the structure have a decorative nature, such as chamfers in the framework of beams. Since the construction is dimensioned for industrial use and heavy machinery it gives many possibilities for adding new structures on to the existing, or to open it up in parts. Structural elements such as beams and columns are not all identical, there is some variation. Introducing new types of structures need not break the way the building historically has been designed.



CONCRETE ROOF
In very bad condition, leaks and asbestos. Needs to be replaced.

CONCRETE COLUMNS
The columns, 400 x 400 mm, on the top floor can freely be changed since the roof needs replacing.

CONCRETE SLAB
A thinner slab, 200 mm, resting on a framework of concrete beams, columns and the exterior brick walls.

SOLID CONCRETE SLAB
A solid concrete slab, 800 mm, carried by a line of concrete columns and the exterior brick walls.

CONCRETE SLAB
Concrete slab, 600 mm, attached to two transverse steel beams as well as the exterior brick walls.

CONCRETE BEAMS, FRAME
The framework with chamfered constructional parts is quite interesting and decorative.

CONCRETE COLUMNS
400 x 400 mm.

BUTTRESSES, SOLID RED BRICK
500 x 500 mm.

STEEL LATTICE COLUMNS
A pair of lattice columns in steel in the opening to what is now building 9. Monumental and unique standing in the big opening.

EXTERIOR WALLS, SOLID RED BRICK
The exterior walls together with the butresses are the oldest building parts of the building. The window openings have been altered in turns when windows have been changed or walled. 500 mm deep up until the slab, 400 mm between slab and roof.

ELEVATOR SHAFTS
Big and robust elevator shafts in concrete, possible to re-ue.

01-3 S.W.O.T. ANALYSIS

STRENGTHS

Open structure/spaces
Central location in the area
Clear direction
Great depth
Gives spatial context
Rough/motley expression
Strong historical connections
Flame retardant materials

WEAKNESSES

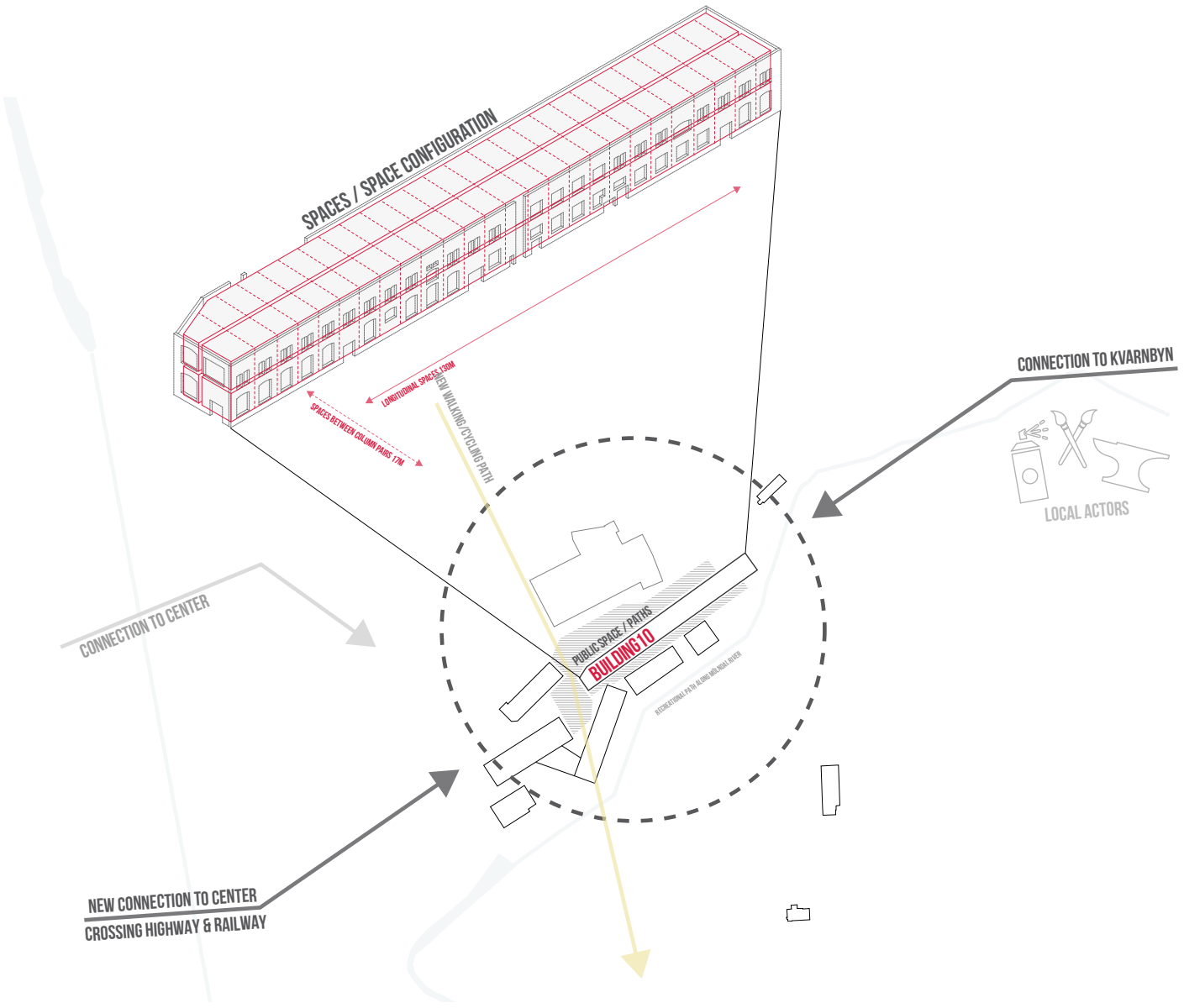
Open structure/spaces
Vandalised, torn
Built-in by other structures
Great depth
Leaky
Rough/motley expression
Uninsulated

OPPORTUNITIES

Openness
Play between inside-outside
Play between new-old
Freedom with openings
Public functions
Node in the new area, could “build” the city
Show and strengthen the building’s and area’s history
Mix of functions in one building
Building on the existing structures
Public spaces around the building

THREATS

Contaminated soil
Badly maintained structure
Long plan process
Flooding risk



01-4 REFERENCE PROJECTS

FORM

Selexyz Dominicanen bookstore
Maastricht
Merkx + Girod Architecten

Dovecote Studio
Aldeburgh
Haworth Tomkins

S(ch)austall
Pfalz
Naumann architektur

Neo Leo / Vertical living
Lüderwaldt verhoff architekten

Hamar Bispegaard Museum
Hamar
Sverre Fehn

Live-make arts centre
Cincinatti
Norell/Rodhe

Neues Museum
Berlin
David Chipperfield

FRAC
Dunkerque
Lacaton & Vassal

INDUSTRIAL DEVELOPMENT

Carlsberg byen
Copenhagen

Landschaftspark
Duisburg-Nord
Latz + Partner

Palais de Tokyo
Paris
Lacaton & Vassal

Where?House
Melbourne
SASHIMI Design

Rote Fabrik
Zürich

PROGRAM

Brooklyn Boulders
Somerville
Arrowstreet + Chris Ryan

Sugarhouse Studios
London
Assemble studios

Unterdessen
Basel

We have continously been building a bank of reference projects; both in terms of planning the program, getting inspiration for developing the architectural intervention and also learning from other industrial refurbishment projects.

01-4 RUHR DISTRICT STUDY TRIP

The Ruhr district of Germany displays a vast industrial history, many architectural projects in indutrial landscapes and transformation projects.

We did a study trip through the region to take part of the industrial culture and to inspire our own work. The trip started off in Düsseldorf and then continued along the route of industrial culture including Köln, Essen, Bochum and Duisburg among others.

02-4 SOIL TREATMENT

The soil in the area is heavily contaminated of especially PAH, aliphatics, lead, cadmium, zink and copper, but also arsenic, mercury, nickel, chromium and barium. In many of the test points, the levels are higher than what is allowed for sensitive landuse which includes residential buildings.[1] Thus it is important to plan for a decontamination of the soil to prepare for future exploitation. Since one won't be able to start building before the detail plan is decided upon, there will probably be a few years until this happens. Since there is time, natural decontamination methods such as phytodegradation, phytoextraction and mycoremediation could be options, instead of conventional remediation processes. This work could have, and should have started in some parts already.

Decontamination of soils can be both expensive and difficult, but it could also be part of the evolution and rehabilitation of the site. There are several plants that extract metals and PAH through their natural metabolism.

Phytoextraction is when a plant absorbs contaminants from the soil and accumulates them in their shoots and leafs. After this one harvests the plants and they can be used to produce biogas or biofuel. Sometimes the use of EDTA to sequester metal ions makes it easier for the plant to extract metals and speed up the process. This method is mostly used for heavy metals while PAH and hydrocarbons can be extracted through phyto- or mycodegradation. The mycilium of mushrooms create certain enzymes that can decompose larger molecules into smaller ones. The decomposing of molecules that the mycilium starts can then be continued by other microorganisms. This gives a richer soil and a greater biodiversity than when using chemicals to remediate.[1] This could be a first step in cleaning the soil that has the heaviest contamination, and later on hyper accumulating plants can continue the work by phytodegradation and extracting heavymetals.

ALPINE PENNYCRESS

Thlaspi caerulescens

The Thalis family is a hyper accumulator of zinc and cadmium. The alpine Pennycress is found in Scandinavia and could therefore be a suitable plant for the site of Papyrus.

FODDER GALEGA

Gaelga orientalis

This plant can be used for bioremediation of oil contaminated soils. Thus, this could be a plant beneficial to clean the soil from PAH and alifates. The bacteria that the plant hosts breaks down the componants and in that way helps to decontaminate the ground.

INDIAN MUSTARD

Brassica juncea

This mustard plant is originally from east Asia and not very common in Sweden. It has in several cases been used for phytoremediation though. It is an accumulator of heavy metals such as lead.

SUNFLOWER

Helisanthus annuus

Sunflowers are hyper accumulators of heavy metals, zinc and lead; but also arsenic, copper, and cadmium. Since all of these metals are present on the site, at the same time as sunflowers are very decorative, they are suitable plants to use.

POPLAR

Populus

Poplars absorb lead and other metals in their biomass, and could therefore be a good component on the site.

WILLOW

Salix viminalis

In Sweden there has been successful trials with farming salix on conaminated sites. It is known to absorb cadmium, chromium, lead, mercury, petroleum hydrocarbons, organic solvents, MTBE, TCE and byproducts, selenium, silver, uranium, and zinc.

PHYTODEGRADATION

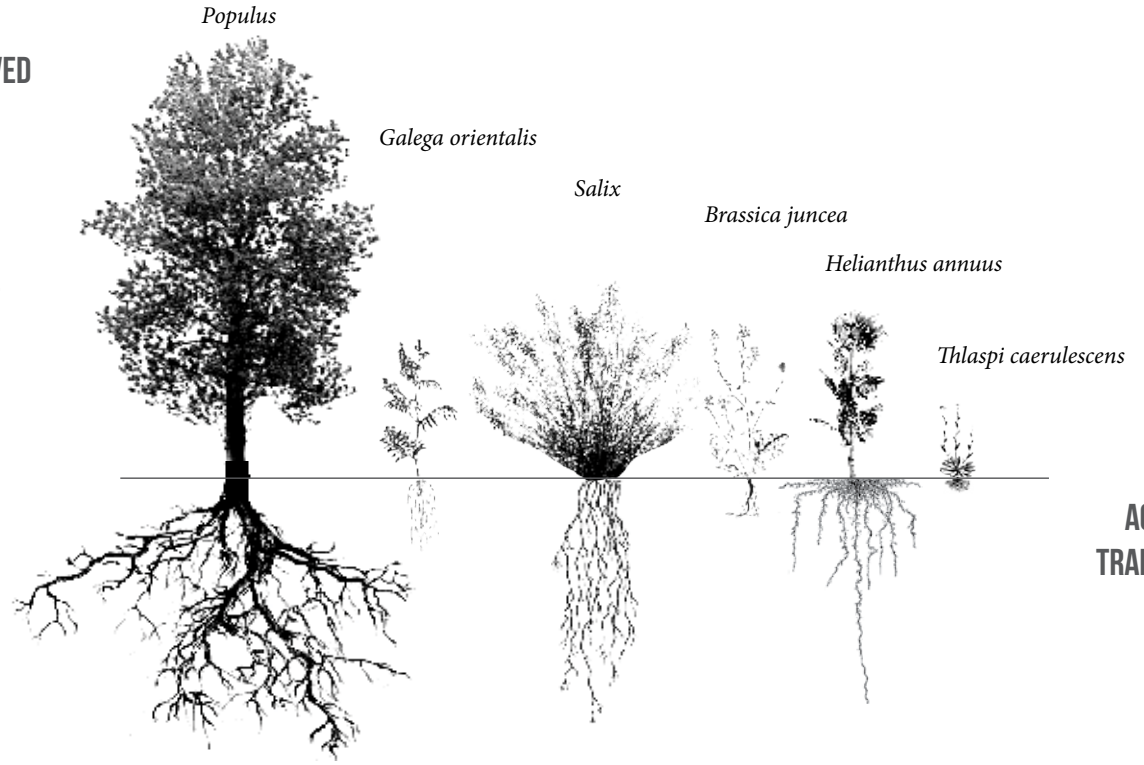
TRANSPIRATION OF VOLATILES

HYDRAULIC CONTROL OF DISSOLVED PLUME

METABOLISM WITHIN THE PLANT, PRODUCTION OF DEHALOGENASE AND OXYGENAZE ENZYMES

ACCUMULATION IN ROOTS AND TRANSLOCATION TO SHOOTS AND LEAVES

PAH UPTAKE



PHYTOEXTRACTION

BIOFUEL, BIOGAS

HARVESTING

ACCUMULATION IN SHOOTS AND LEAVES

ACCUMULATION IN ROOTS AND TRANSLOCATION TO SHOOTS AND LEAVES

HEAVY METALS UPTAKE

02 CONCEPT OVERVIEW

02-1 DESIGN CONDITIONS

A summary of the most important conclusions and reflections
from the background studies that we bring into the design phase.

CONTEXT

HISTORY

The historical importance of the paper industry in Mölndal is evident. In the transformation of building 10 we want to reflect this and include it in a form of narrative. Something that can be done both in the design and programming of the building.

PROGRAM

Due to the building's central location in the area and as a key building in linking together Mölndal, we propose a strong mix of (mostly) public programs. Moreover, in order to establish functions gradually, in a more organic development, time is an important design condition. The transformation of the area and the building should counteract displacement of actors and instead advocate a (economic) diversity for a more stable and attractive city.

MÖLNDALA'S PROJECT

The urban development that Mölndala AB plans for the area is our starting point for what will happen around building 10. The choice is made mainly to limit ourselves to a building's design and also to be able to put it in a realistic context. The detailed overview plan available is also an aid to interpret the future context surrounding both the building and the area.

SURROUNDING

In a future scenario of increased sea level, land rise and extreme weather, floods are inevitable in the area. Also, after decades of industrial usage of the grounds, contaminated soil is another aspect to relate to. We want our design directly to handle these problems. The conditions for the surrounding urban space are given by Mölndala's building conservation proposals.

BUILDING

TIME LAYERS

As the paper industry changed, building 10 developed as well, and the different time layers are displayed in the building. The most important thing in this regard is that we do not wish to restore the building to some former appearance or state, especially since it's in principle not possible to deduce a first existing base. Instead it will be interesting to see how the building has changed over time together with the industry.

MATERIALS

Time layers can also be seen in material changes and material selections. Especially the ones made in the late 1900s have been made with less care which gives a bit of a patched look. Brick and concrete are the most prevalent materials. New additions should be clearly defined and create new material and time layers themselves. Some elements that remind of the building as a factory, and also how the past 7 years have left their mark, is something we want to preserve and use in our reprocessing.

STRUCTURE

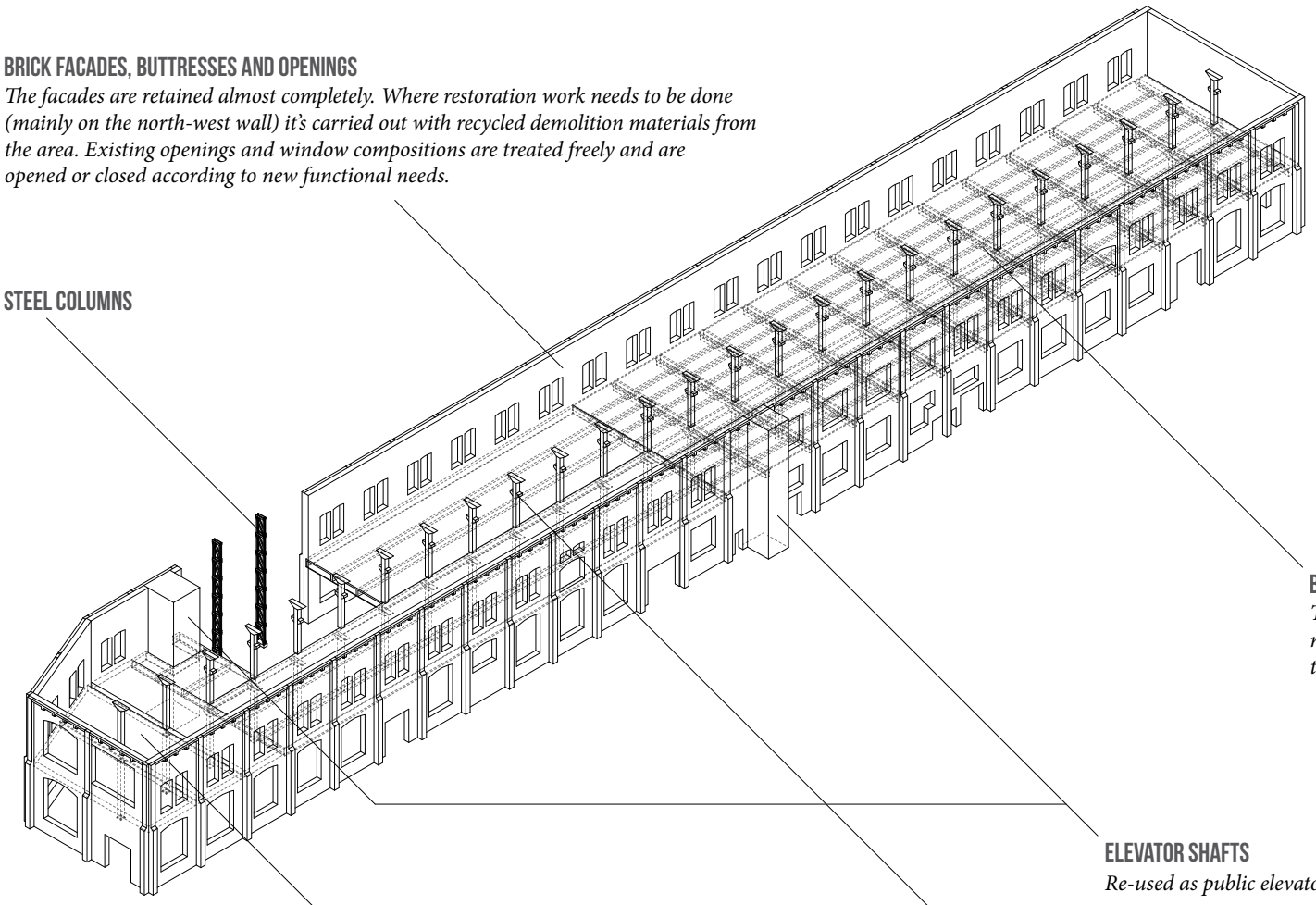
The structural design reflects robustness and is in places very decorative. The load-bearing brick walls and the visible pillar and beam system in concrete are examples of this. The construction is also a key issue from a preservation point of view, and when it comes to a sustainability aspect and the idea of reusing the existing building. It is the building's skeleton that can get a new body. The walls are uninsulated which depending on the future use must be reviewed. Given the poor condition of the roof, the outer walls and concrete skeleton are of the greatest preservation value. Although we would like to use the existing structure as much as possible, we are not afraid to open up slabs for example and make changes to the design, mainly to create other lighting and room conditions than those existing today. The building's shape can be both limiting and an opportunity. If there would be only one type of function in this building volume, the building will be a barrier in the area. Instead we want to open up and make the building part of the urban space.

DESIGN

02-1 EXISTING BUILDING CONDITIONS

BRICK FACADES, BUTTRESSES AND OPENINGS
The facades are retained almost completely. Where restoration work needs to be done (mainly on the north-west wall) it's carried out with recycled demolition materials from the area. Existing openings and window compositions are treated freely and are opened or closed according to new functional needs.

STEEL COLUMNS



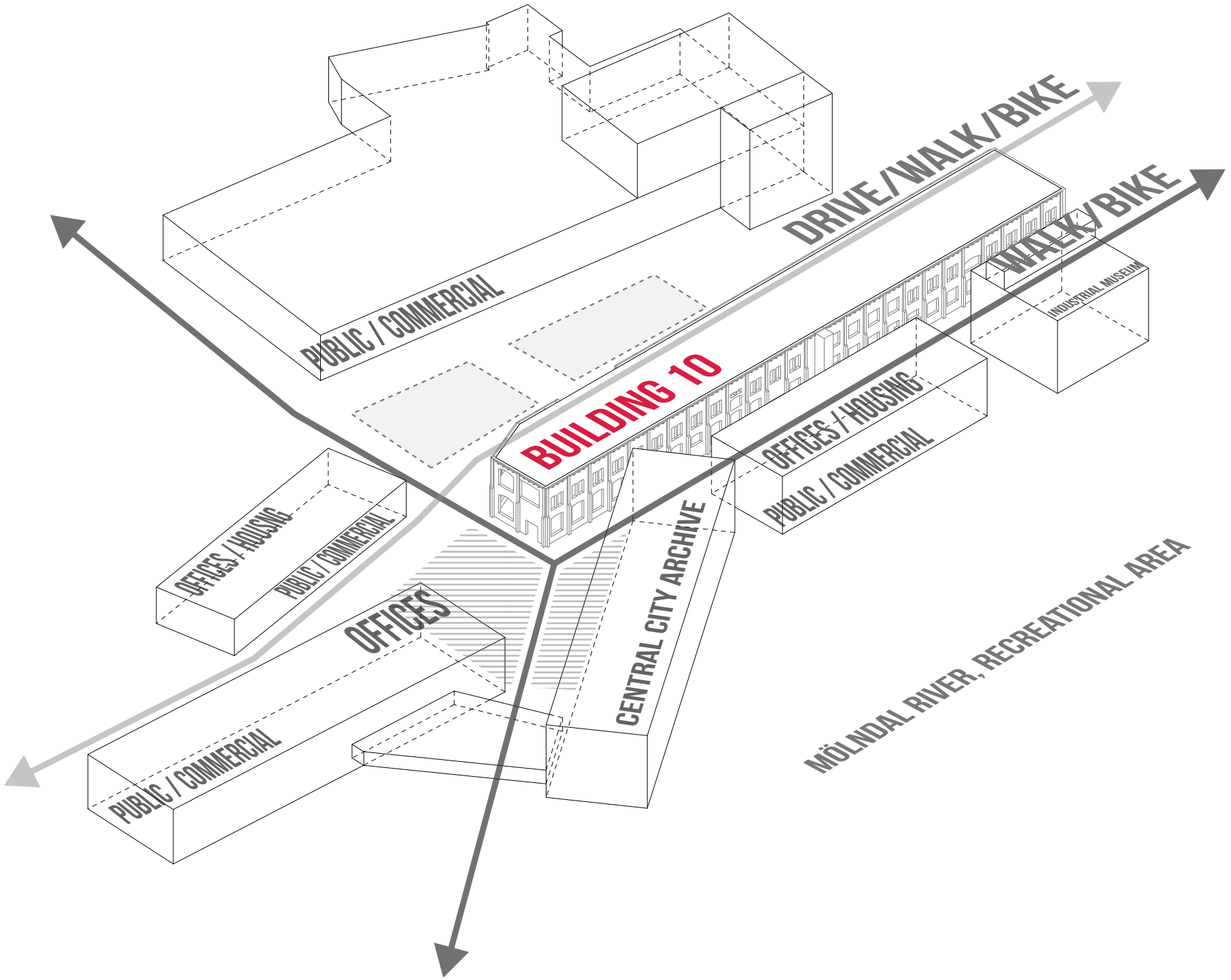
BEAM FRAMEWORK
The framework is kept visible, with new structures added or open without the slab so only the beams remain.

ELEVATOR SHAFTS
Re-used as public elevators.

SOLID CONCRETE SLABS
The more solid part of the slabs can be cut between columns and parts can be removed if desired. The large dimensions offer more opportunities to freely modify the structure. Openings are made for inserting new volumes and structures, also for increased natural light to the ground floor.

COLUMNS
The concrete columns on the ground floor are retained. New structures adapts particularly to how the pillars are distributed on the ground floor. On the upper level however, one can freely remove columns because the roof is removed.

02-1 SITUATION / SPATIAL CONDITIONS



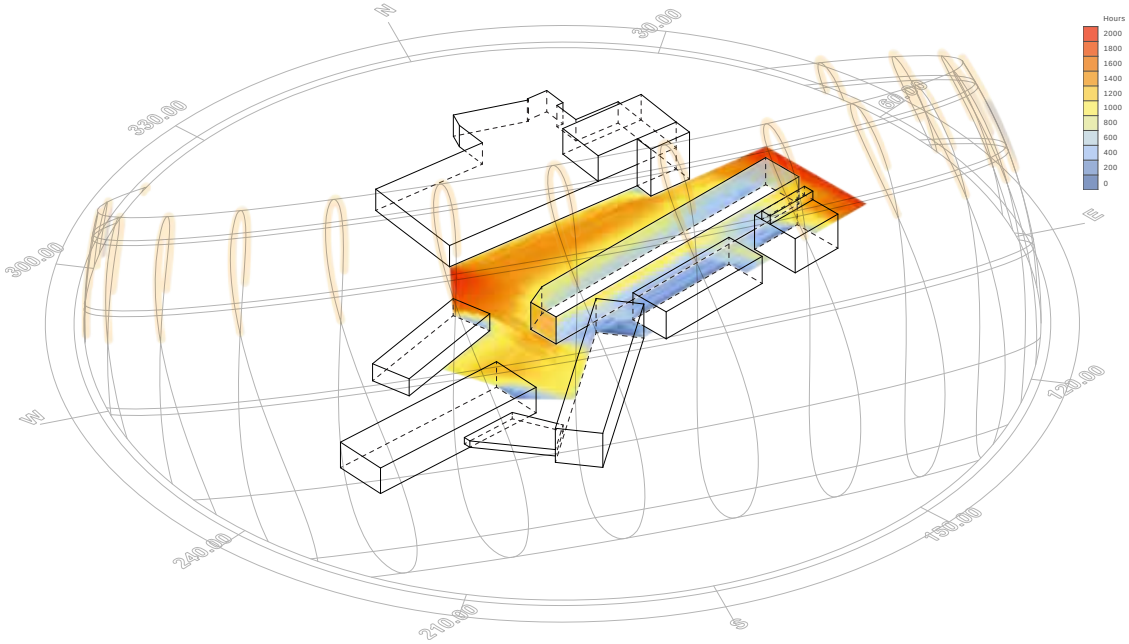
02-1 SOLAR STUDY

The diagrams display the number of hours of direct sunlight that hits the surfaces; horisontally around the building and vertically on the facades.

SUMMER, MAY - AUGUST

Even in summer the south-east facade and street space have quite some shade. This side would normally be the most exposed and risk to be overheated due to high solar gains. The overall risk for over heating due to solar gains through the facade is thus very low. Opening up the building generously for better daylight situations is reasonable.

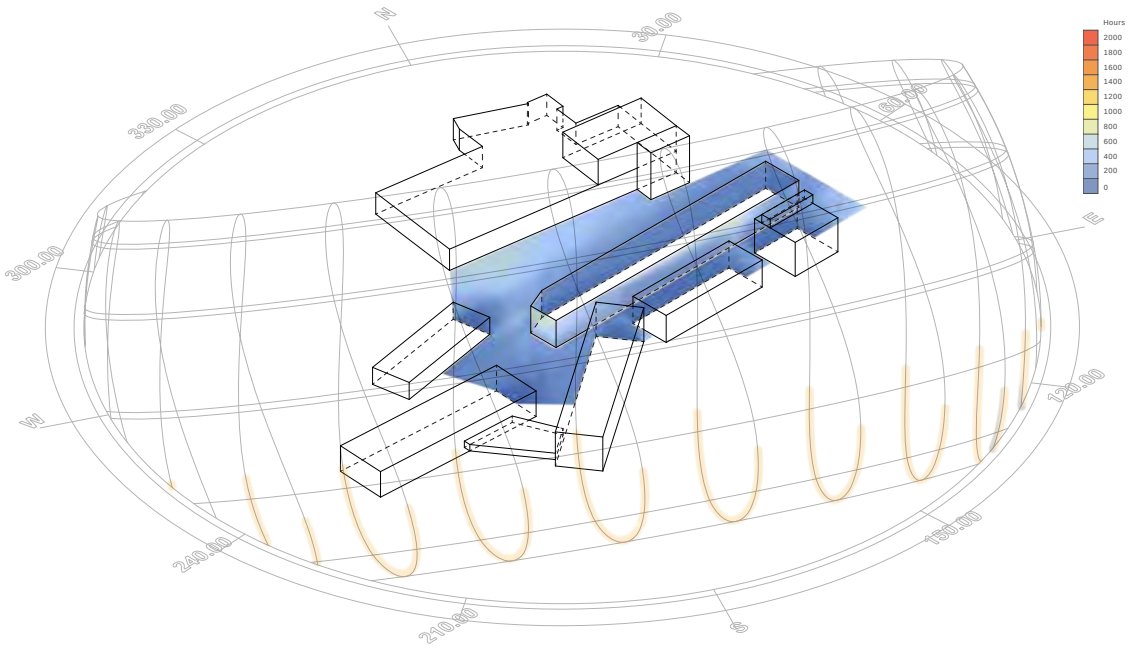
The spaces outside the north-east as well as the south-west sides of the building have good sun spots.



WINTER, NOVEMBER - FEBRUARY

In winter one can see that the top parts of the facade still get quite some sunlight. Since the surrounding buildings are not significantly taller, the roof will always have highest possible number of solar hours.

The spaces between the surrounding buildings on the south-east side provide better light conditions for the building since light reaches through here (especially in summer thouh).



02-2 DEVELOPMENT CONCEPT

Like several buildings in the area, building 10 is decaying while waiting for its destiny. It has been left without any function or maintenance for almost a decade. In effect, it has been a victim of further vandalism and theft. Contrary to how the building has been treated, we would like to make the argument that an unplanned reuse of the building would have been a better way to go after the factories closed. Stewart Brand writes about abandoned "low-houses" and "[…] what these buildings have in common is that they are shabby and spacious. Any change is likely to be an improvement." (Brand, 1994) However, our intervention will be a planned form of reuse with the aim to act between what can be called marginal and monumental solutions. The marginal solution needs users to invest their own resources into a space, and thus according to their economic capacities. The monumental solution means that a representative and pre-defined space is created *for* the user, with the upside that it can give a clear recognition to the existing building and save its cultural historical value (Olshammar, 2002). The aim is to gain a wide spectrum of users with varying professions, knowledges and economic situations; and further on to avoid displacement of the users and actors in the building. The idea of our intervention is a mix of the two solutions where the building's inhabitants and functions are allowed to be changed, developed, expanded or shrunk; to be evolved.

Due to the building's central location and historical importance, it holds the potential of becoming a catalyst and icon in developing the new cityscape. A strong combination of public, semi-public and private programs, targeting a diverse user group, makes the building efficient in this manner. Furthermore, creative activities in different forms are promoted in order to ensure an economic strength and diversity. In fact, the creative sector proved to live through the recent financial crisis without major economic blows compared to other sectors (Baum, Christiaanse, 2012). In this way, a creative incubator community provides a certain economic resilience. The building is more or less active 24/7 and creates a place of synergies, unexpected meetings and new possibilities for collaborations. In similarity with "a dense city where innovation is spurred by high accessibility of information and services" (Jörnmark, 2014), the building is dense, and like a city itself.

Contrasts between materials, spaces, new and old help preserve, display and define the building's time layers, and provide patina. The new additions and architectural elements define an evolutionary step of the building, in which it adapts to people and varied functions in contrast to its previous singular function.

EVOLUTION OF BUILDING 10

PHASE 1

PHASE 2

1850 1896 1900 1950 2000 2006 2011 2014 201?

1896 - 2006
Papyrus is founded and operated

USAGE
Machine hall

2006 - 2011
Papyrus goes bankrupt in 2006

USAGE
No official function
No maintenance
Graffiti
Urban exploration
Vandalism and thefts

2011 - 2014
City of Mölndal buys the building

USAGE
No official function
No maintenance

A MISSED OPPORTUNITY

2014 - 201?

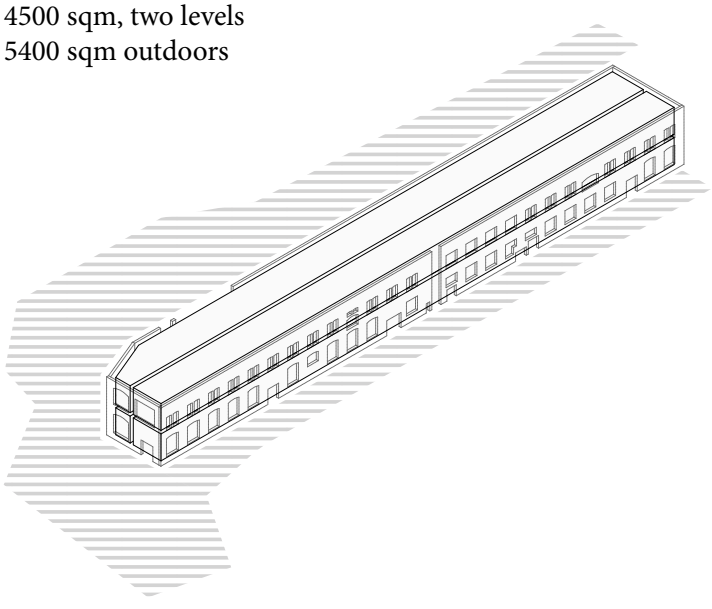
USAGE
Temporary initiatives from the city, private persons and entrepreneurs.

201? - 21??

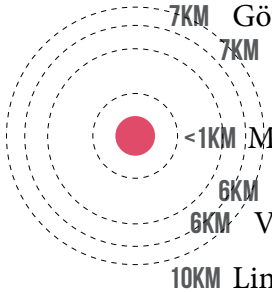
USAGE
The building evolves both in function and character as the city develops, and becomes a catalyst in the new city.

SIZE

4500 sqm, two levels
5400 sqm outdoors



COMMUNICATION



7KM Göteborg center
7KM Mölnlycke
<1KM Mölndal center, 3M+ travelers/an
6KM Kållered
6KM Västra Frölunda
10KM Lindome

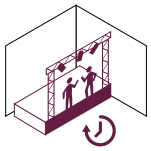
MEANS OF CONVEYANCE

ACTIVITY

24 / 7

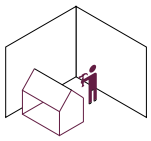
02-3 PROGRAM OVERVIEW

POP-UP EVENTS



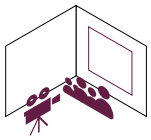
EVENT SPACE

Initiatives that can be driven for a short or limited time. Different types of events such as exhibitions, workshops, lectures, concerts and performances can take place. Installations, open to the public, where you come together and create something, may be a good way to establish a community. Could also be a way to activate both the building and the people in its vicinity.



D.I.Y.

The freedom to use and create in the building can be a first step in its development; virtually all activation of the building in the current situation is an improvement of the situation.



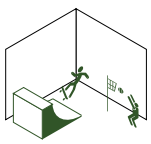
FILM

A place for film where people can gather. The shows can promote local or independent productions. Schools and other institutions can also benefit from this.

MARKET

Markets to promote food, clothing and crafts from local producers as well as flea markets for reuse can take place in the building's vast spaces and the lot outside.

ACTIVITY & RECREATION

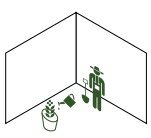


SPORTS & PLAY

Movement and activity inside the building in the form of, for example skateboarding, basketball and parkour. Sports that initially do not require huge impact and could become permanent venues. Also a place that appeals to younger generations.

PHYTOREMEDIATION PARK

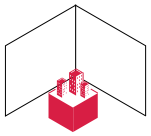
Greenery in form of plants for phytoremediation of the contaminated soil. A natural way to deal with the negative impact to the soil from the industry. Could transform over time into recreational spaces.



URBAN FARMING

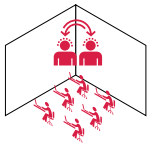
Recreation areas are supplemented with public allotments for the production of local food products.

CREATIVE COLLECTIVE



URBANUM

An urban forum for the new district shows plans, ideas and invites people to engage and discuss around the development of the new area and Mölndal.



WORK SPACES

A platform for anyone who needs a temporary workplace or someone to share and create ideas with. Spaces of different character appeal to many different disciplines from the typical desktop worker to the artist who needs an atelier. The diversity of professions, people and services is essential.

TEMPORARY BUSINESSES

Spaces offered under flexible conditions and durations for people who want to start up a company, need an office or trying a business but have limited resources.

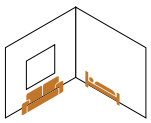
CO-OPERATIVE SHOWROOM

New businesses, artists, entrepreneurs and vendors of local products have the opportunity to take advantage of a store and showroom operated cooperatively.

OPEN WORKSHOP

Under one roof, machines and tools are gathered for manual and digital fabrication. People working in the building, students, individuals and businesses can come here to realize their ideas.

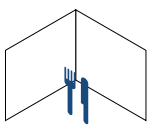
HOUSING



COMPACT LIVING

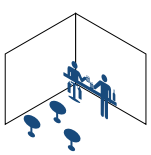
Especially cheap rental apartments that are suitable for 1 person in a compact fashion where you share space with each other. Apartments in the building further extends the building use and activity.

FOOD & DRINKS



RESTAURANT

Locally grown crops can be served and the restaurant can help activate the building during both day and night.



BAR & CAFÉ

Drinks and simple food, a place to meet among the other activities in the building.

02-3 STAKEHOLDERS

MÖLNDAL, INHABITANTS AND SURROUNDING

Even though the main target group of the program structure is the younger adults of Mölndal, there is something in the building that can appeal to anyone living in the city or its proximity. Children, teenagers and older people might find an open urban recreational space for spontaneous meetings, activity and creativity.

SOLE ENTREPRENEURS

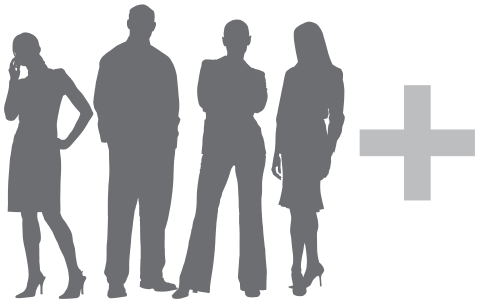
Individuals striving to make their business work, whatever it might be, can find an alternative working space with many possibilities and flexibility. By sharing both space and auxiliary gadgets there are obvious economic advantages. Also, by allowing short-term leases this space can become the testing ground for many start-ups. Furthermore, an individual especially, could gain great mental boost and support from their indirect co-workers.

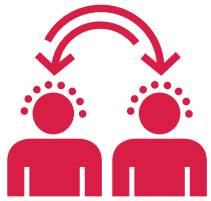
SMALL BUSINESSES

The same spaces will also be shared and used by people already in collaboration, of different disciplines and knowledges. The building will allow small businesses to grow, both by offering different types of spaces and also by giving oppurtunities to exhibit and showcase the on-going work or products.

MEDIUM SIZED BUSINESSES

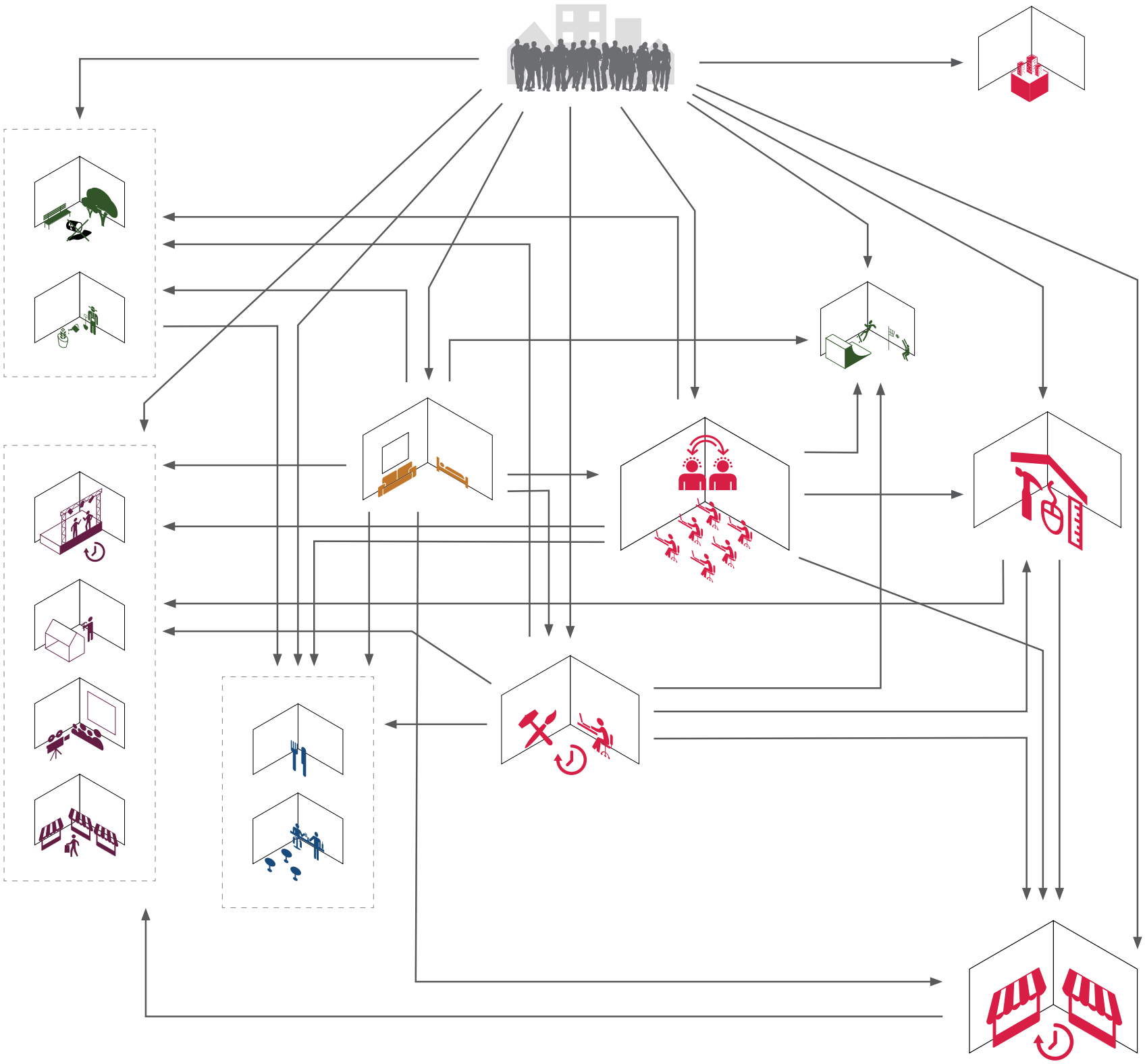
Bigger groups of entrepreneurs or businesses in need of more privacy can also find a place in the building. Self-operated spaces can be adapted and changed in accordance to needs and financial possibilities. Of course larger groups might as well find the open office solution appealing and giving.





02-3 PROGRAM FLOWS

This is a study of program connections where the arrows represent different types of flows; ideas, products, interests, services or social connections. The point is that all parts are somehow interlinked, and function together in a system.



02-3 PROGRAM ESTABLISHMENT PROCESS

TIME →

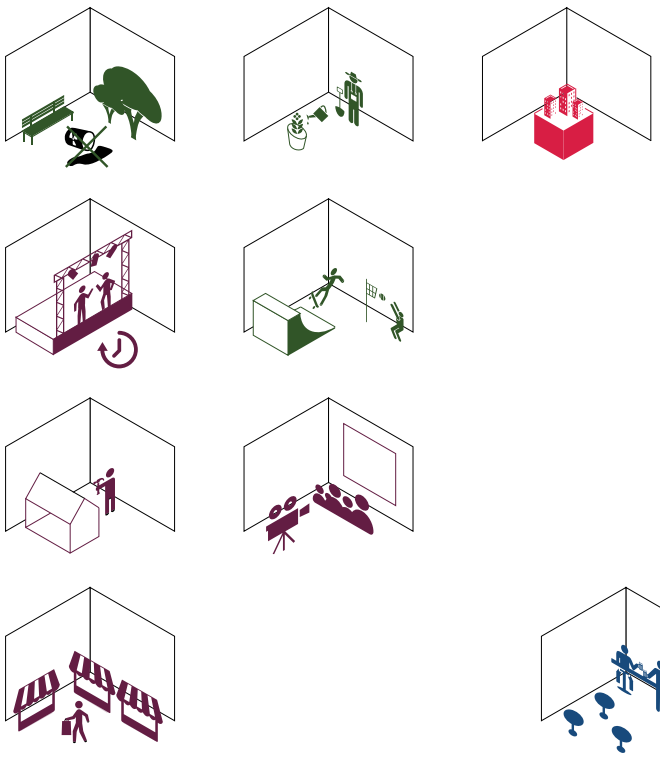
PHASE 1

In the first phase programs are implemented that have the ability to work directly and that are of a more temporary nature. Less impact on the building is required and, therefore, the building can have an immediate catalyst effect.

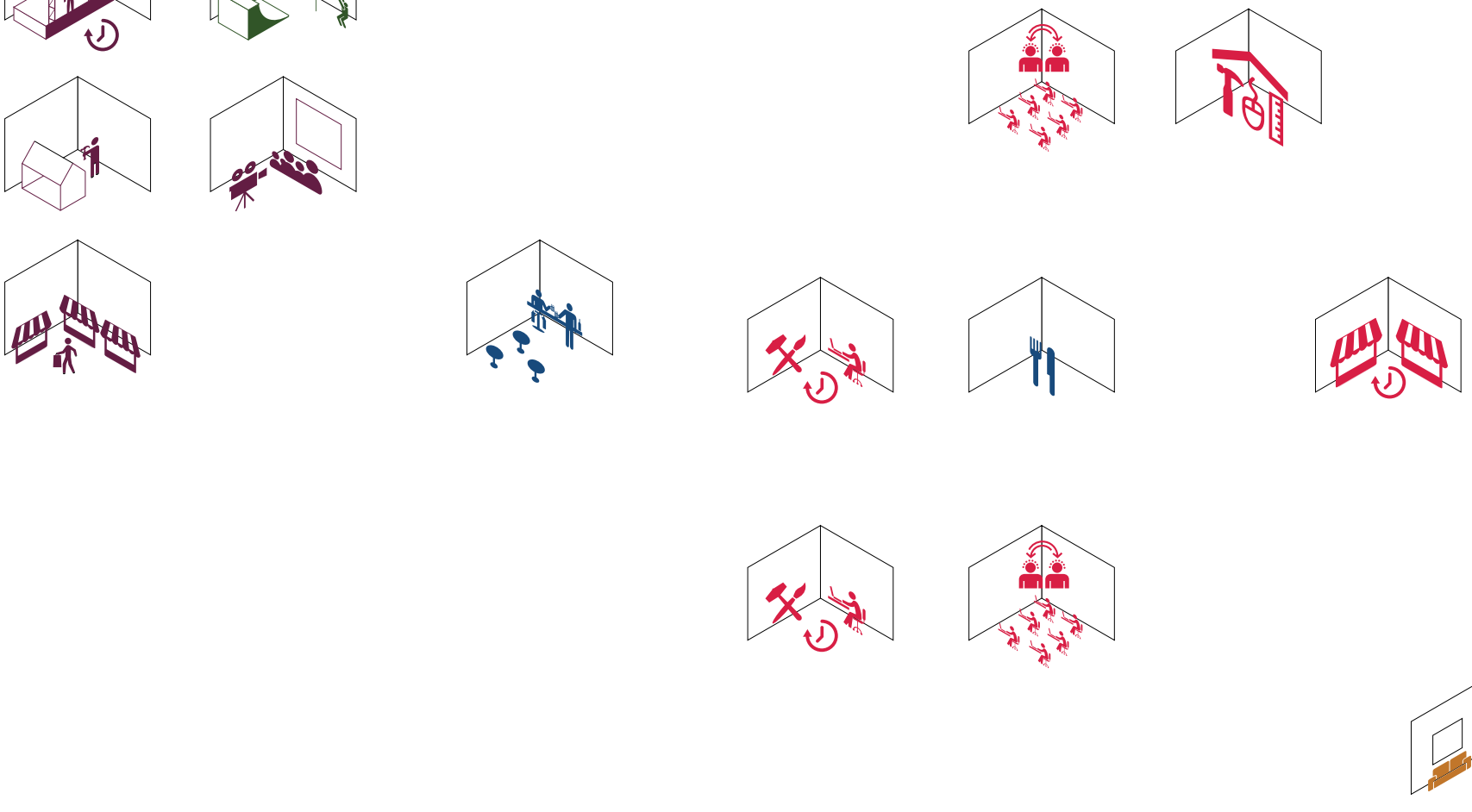
PHASE 2

As the city develops, the base for activities and public programs change as well. As the city changes the building evolves. Programs established in the first phase can be expanded, shrunk or removed. Still, space for functional and physical expansions exists. The physical interventions are intensified and gives the building an additional architectural layer.

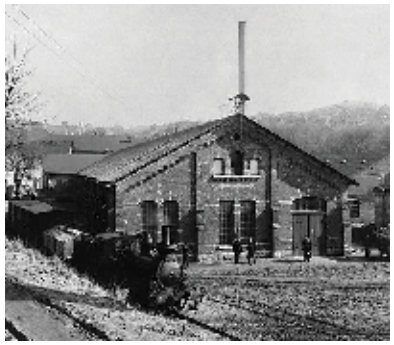
PUBLIC

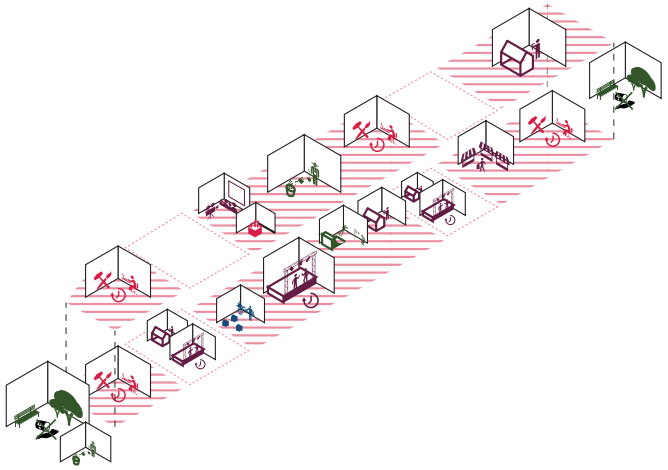


PRIVATE



02-3 PROGRAM STRATEGY: SPACE IN TIME





1850 | 1896 | 1900 | 1950 | 2000 | 2006 | 2011 | 2014 | PHASE 1 | PHASE 2

1896 - 2006

Papyrus is founded and operated

USAGE
Machine hall

2006 - 2011

Papyrus goes bankrupt in 2006

USAGE
No official function
No maintenance
Graffiti
Urban exploration
Vandalism and thefts

2011 - 2014

City of Mölndal buys the building

USAGE
No official function
No maintenance

PHASE 1

USAGE
Temporary initiatives from the city, private persons and entrepreneurs.

PHASE 2

USAGE
The building evolves both in function and character as the city develops, and becomes a catalyst in the new city, a breeding ground for cultural and incubator movements.

A MISSED OPPORTUNITY?

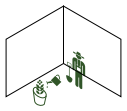
PHASE X ENVISIONED STATE

ENVISIONED STATE

USAGE

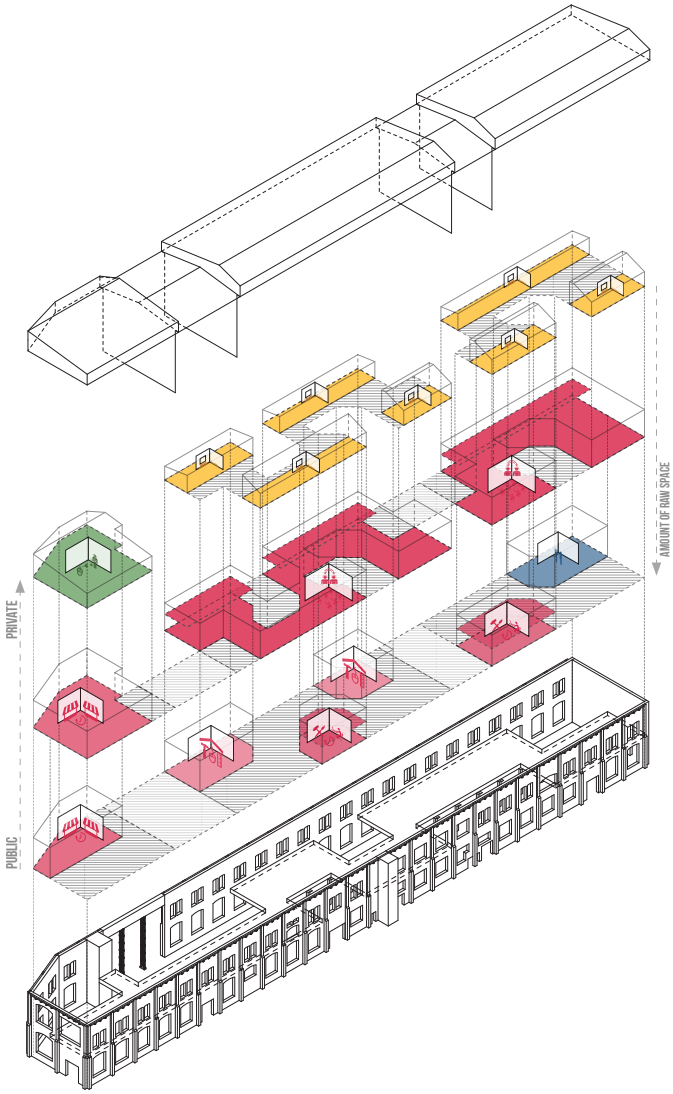
The building is more or less fully exploited and has developed into a more set structure. However, and most importantly, it still carries on the idea of evolution. Functions inside the building have the possibility to change and adjust as the city and its people evolve and their needs and demands change. In this way, the building can remain a catalyst and a key point building in the center of new Mölndal.

URBAN FARMING

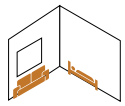


CO-OPERATIVE SHOWROOM

OPEN WORKSHOP

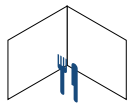


COMPACT LIVING



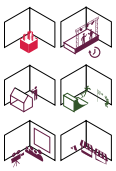
CO-WORK SPACES

RESTAURANT



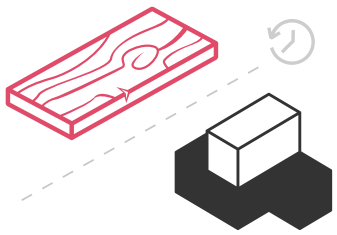
TEMPORARY BUSINESSES

RAW SPACE / CO-SPACE

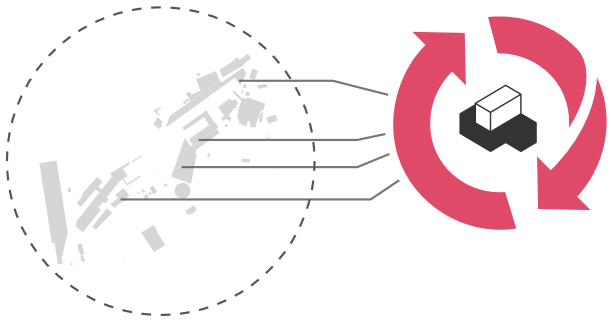


URBANUM
PERFORMANCE SPACES
DIY
SPORTS / ACTIVITY
FILMS
MARKETS

MATERIALS, TIME LAYERS & CONTRASTS

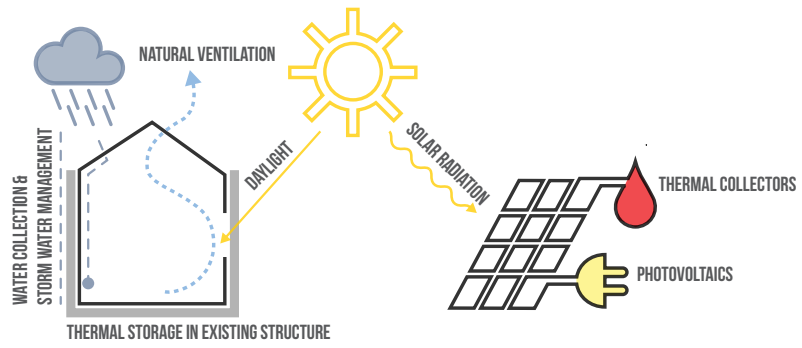


The materiality of the new additions contrasts to the existing brick and concrete skeleton. The contrast primarily highlights the difference between what is new and old; and in this way the material timelayers in the building become defined and understandable. Furthermore, there is a structural purpose where a 'softer' material meets a 'harder' one. This will ensure a better preservation status of the re-used structure. The idea is also for new materials and structures in the building to be of simple character. Both in order to make better use out of the existing, and also in order to strive towards low costs.



Just like the building itself is re-used, local materials are used in the restoration and construction processes. The extensive demolitions in the area will free large amounts of building materials, especially bricks that have good recycling properties.

ENERGY & ECOLOGY



Integrated systems and strategies involve the handling of natural resources for both energy production and energy savings. Water, air and the sun are the basic elements designed for, at the same time as the opportunities of the existing building are used as well.

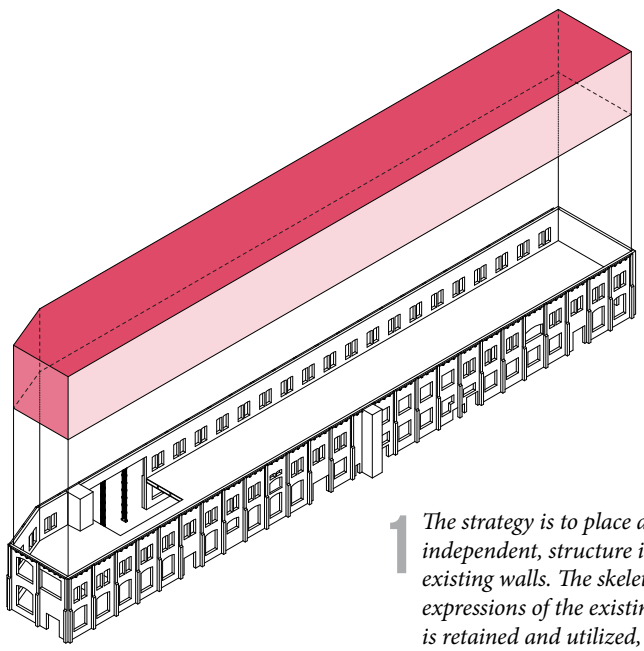
Winter gardens and a greenhouse, maintained by the local community, become synergy spaces for meetings and stimulate the senses. Local food production adds a layer to the local ecosystem inside the building. Phytoremediant plants help decontaminate the soil in the area.

03 DESIGN PROPOSAL

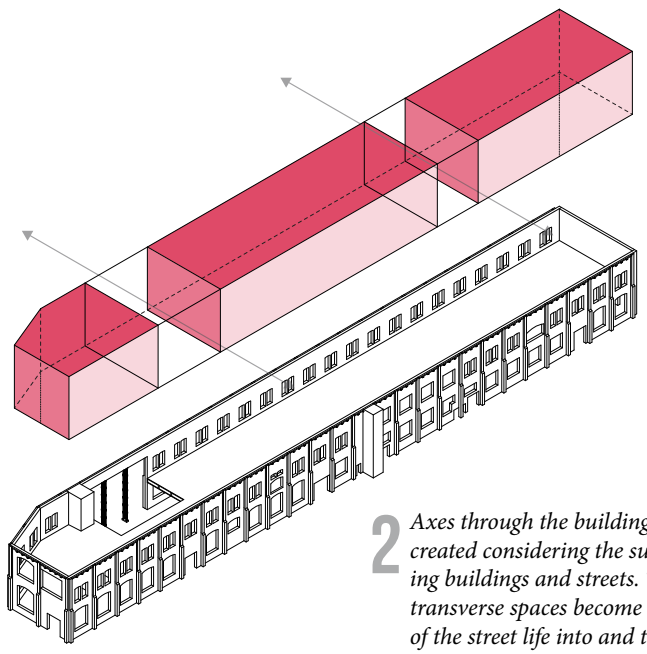
03-1 STRATEGIES

03-2 DRAWINGS & IMAGES

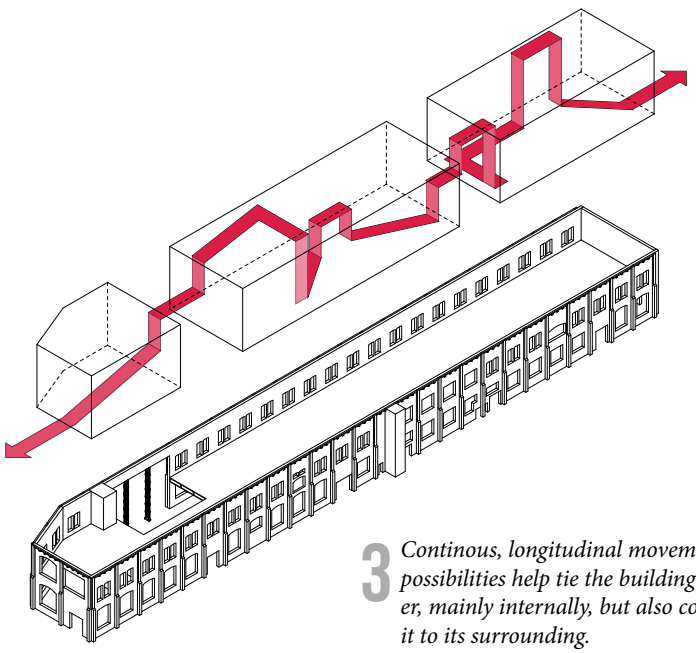
02-4 SHAPE, STRUCTURE, MOVEMENT & FUNCTION



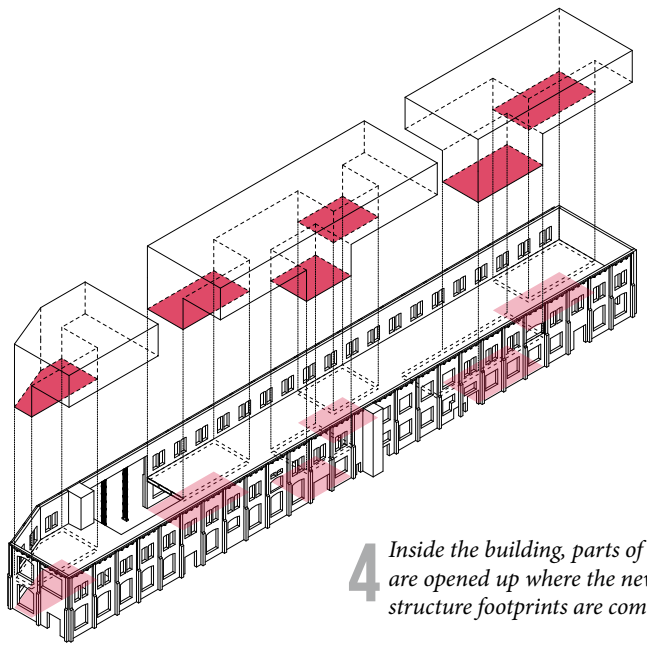
1 *The strategy is to place a new, independent, structure inside the existing walls. The skeleton and expressions of the existing building is retained and utilized, and the new volume contrasts in both materials and workmanship to the original concrete and brick construction.*



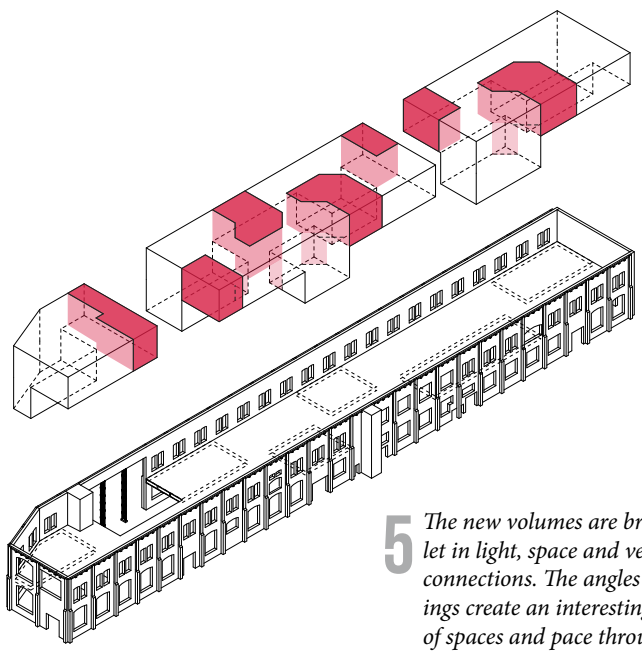
2 *Axes through the building are created considering the surrounding buildings and streets. The two transverse spaces become extensions of the street life into and through the building.*



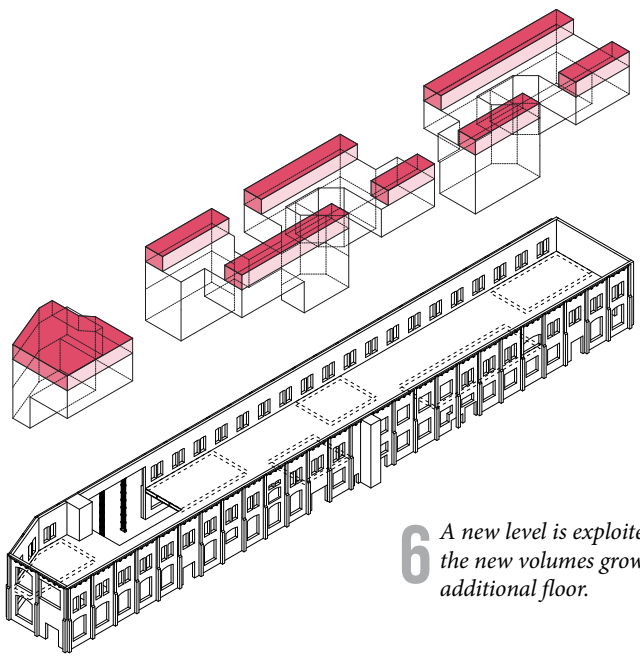
3 *Continous, longitudinal movement possibilities help tie the building together, mainly internally, but also connect it to its surrounding.*



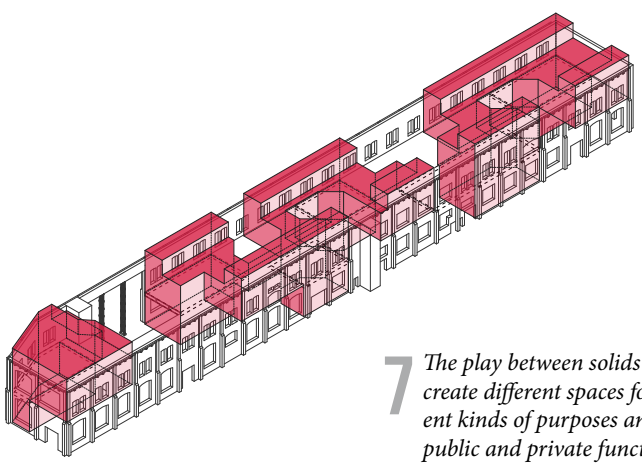
4 *Inside the building, parts of the slabs are opened up where the new, adapted, structure footprints are coming down.*



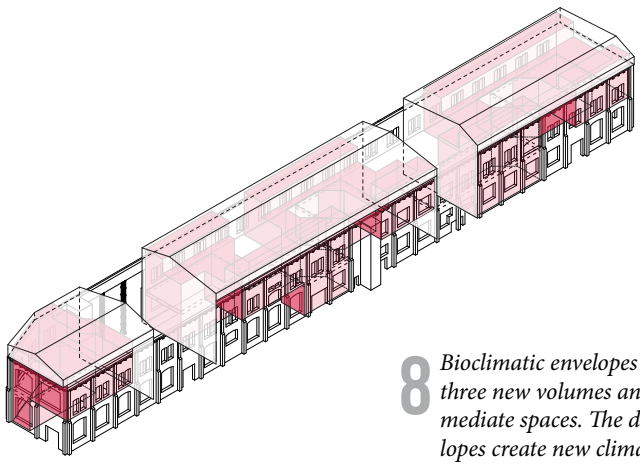
5 *The new volumes are broken up to let in light, space and vertical visual connections. The angles and openings create an interesting variation of spaces and pace through the building.*



6 *A new level is exploited by letting the new volumes grow with one additional floor.*



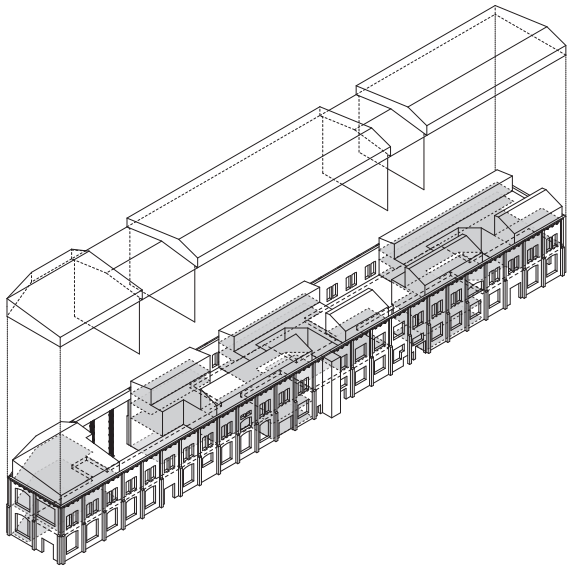
7 *The play between solids and voids create different spaces for different kinds of purposes and users; public and private functions are also mixed. Space and program sequences create interesting paces and rhythms through the building. Varying architectural values of the spaces reflect the building's diversity.*

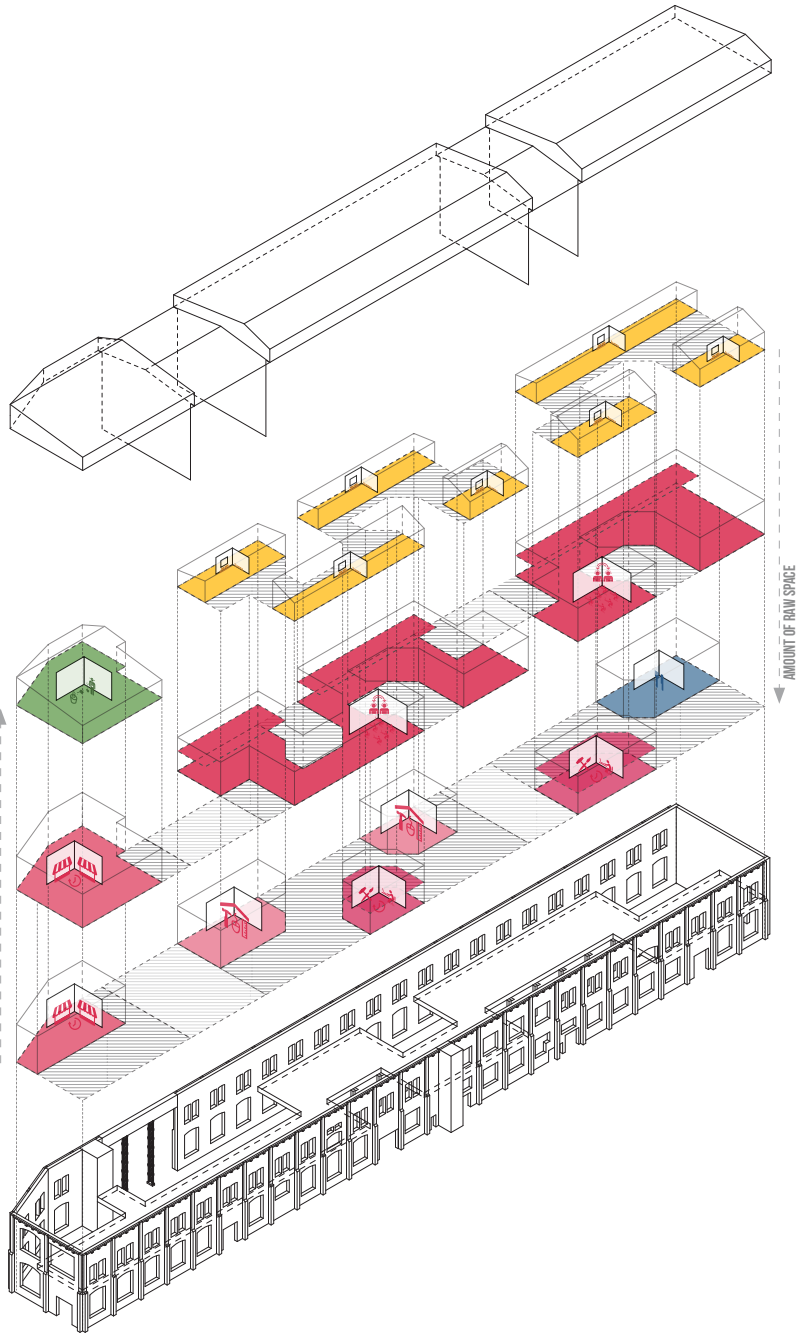


8 *Bioclimatic envelopes embrace the three new volumes and their intermediate spaces. The different envelopes create new climate conditions and variations.*

03-1 FUNCTIONS

The new inserted structures contain the indoor functions. The volumes are generous in height on the ground and first floors, thus there is room for mezzanines. The bioclimatic envelope defines the border between the outdoor and the intermediate zones. Functions are placed considering degrees of privacy, climates, communications and connections.





URBAN FARMING

A shared greenhouse is located on the top floor for the best light and heat conditions. Both the public and the local restaurant have the possibility to grow their own food here.

CO-OPERATIVE SHOWROOM

The showroom in two floors, with shop and exhibition possibilities, is located in the southwest end of the building, the 'front'. Good visibility and accessibility from the outside. The raw space can be used to extend the exhibition space when needed.

OPEN WORKSHOP

The workshop on ground floor is divided into a fabrication workshop and a paper and printing shop. Both are accessible from the first and ground floor. The raw space is used mainly for working spaces for the workshop, and becomes a showcase at the same time.

COMPACT LIVING

The housing units are on the second floor, which is the top and most private level in the building. The raw space between the actual apartment units is a shared living room, meeting space, work space and winter garden combined.

CO-WORK SPACES

The main co-working spaces are on the first floor with mezzanines in parts. The floors are diversified with different types of working spaces and meeting rooms. The raw spaces are used for alternative working spaces, lobbys and also constitute atriums for better daylight situations.

RESTAURANT

The restaurant is located on the ground floor and has direct connections to the outside in the form of entrance, loading bay and possibilities for outdoor serving. The raw space can be used for additional seating during peak hours.

TEMPORARY BUSINESSES

Spaces for individual businesses, shops or larger offices are on the ground floor, with possibility of mezzanines. Also with direct connections to the outside for good commercial and showcasing abilities.

RAW SPACE / CO-SPACE

In general, this is a shared space for all the functions in the building, but it is also the venue for temporary events like lectures, workshops, film showings, markets, concerts, exhibitions, galleries as well as sports and activities. The public is invited and the space becomes like an urban recreational living room for social meetings and full of synergy.

03-1 COMMUNICATION

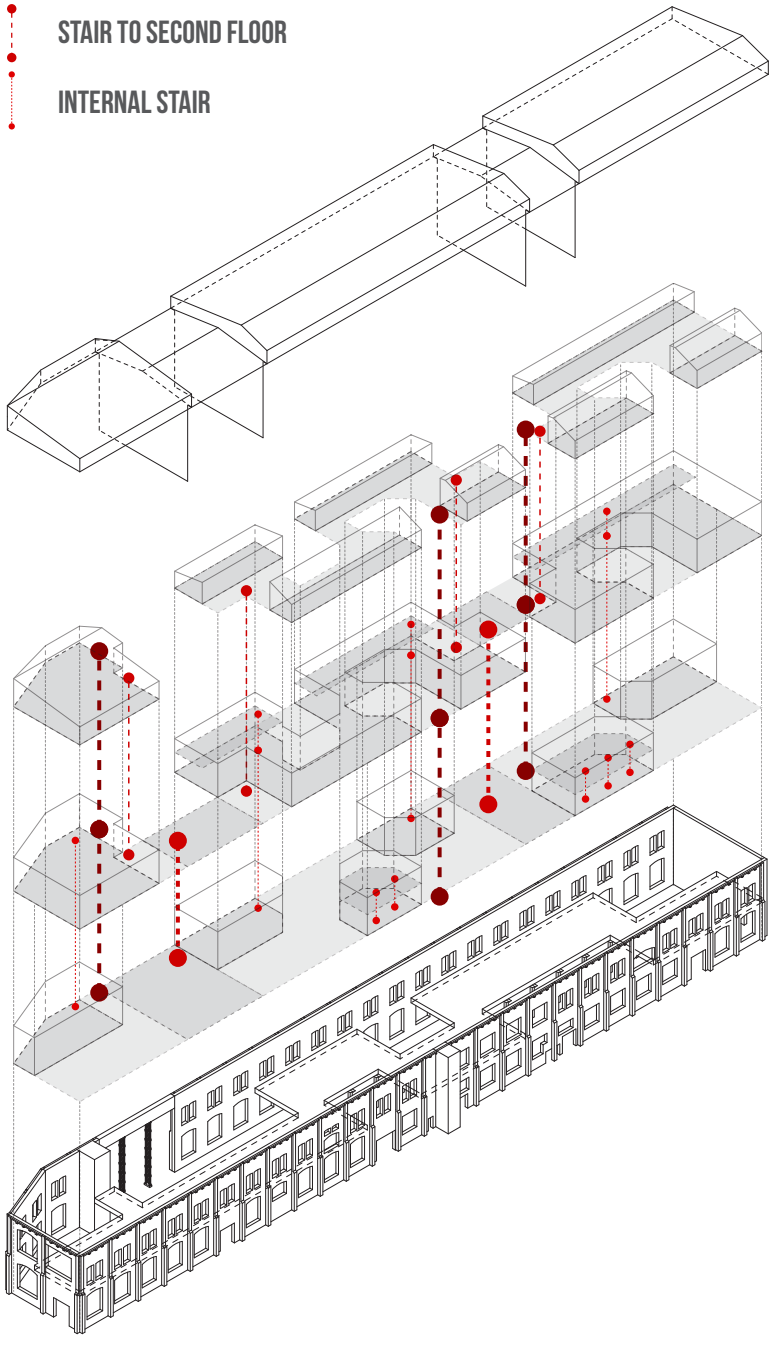
VERTICAL COMMUNICATION

ELEVATOR

PUBLIC MAIN STAIR

STAIR TO SECOND FLOOR

INTERNAL STAIR

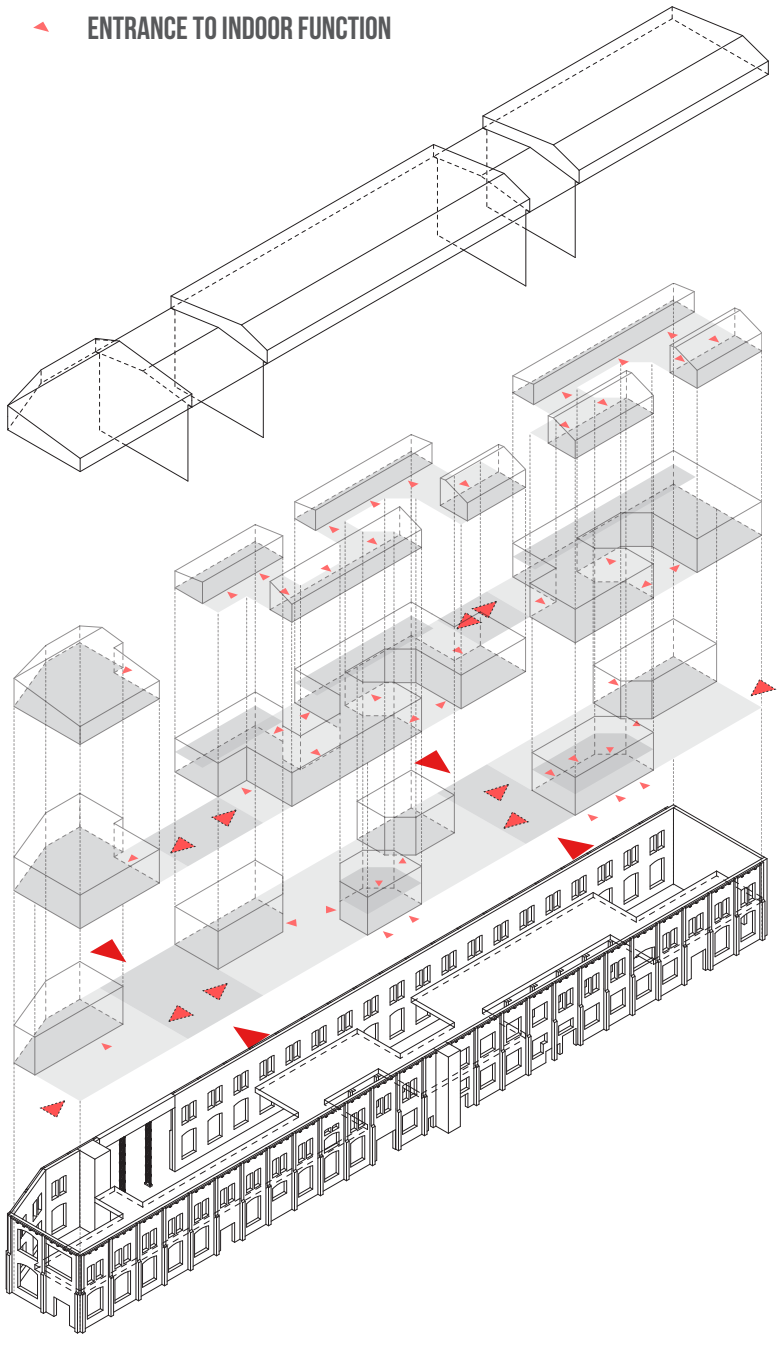


ENTRANCES

MAIN ENTRANCE, OUTDOOR

ENTRANCE TO INTERMEDIATE ZONE

ENTRANCE TO INDOOR FUNCTION



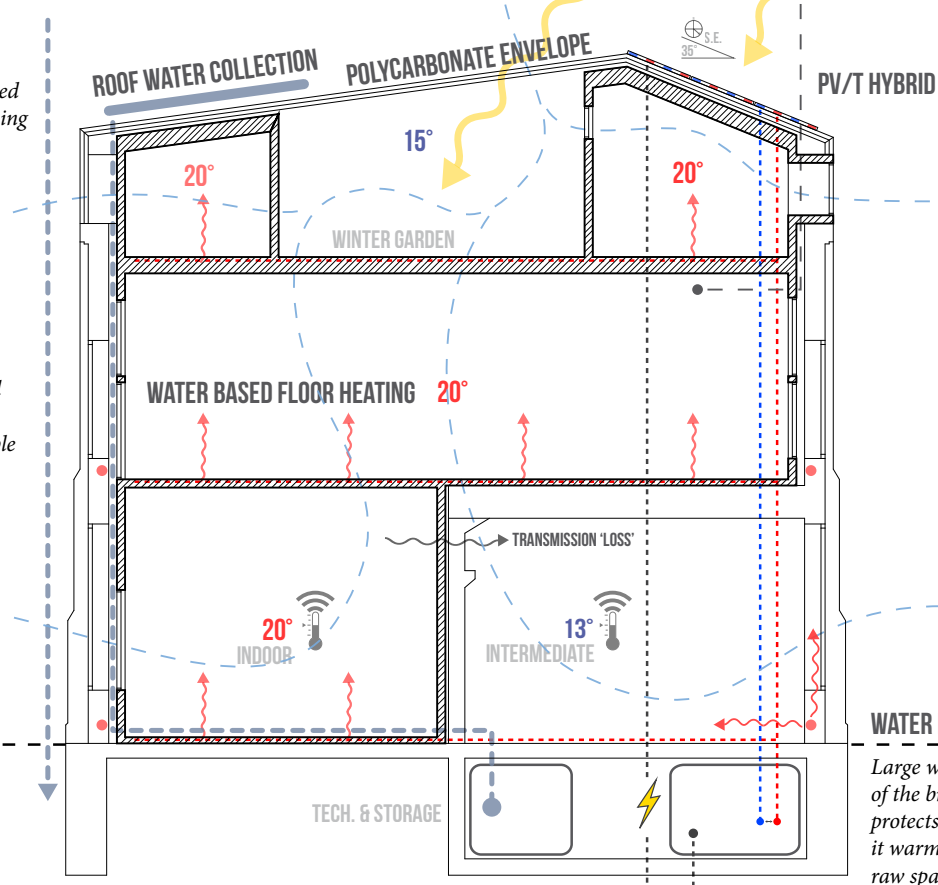
ILLUSTRATIVE ENERGY SECTION

DEMAND & SEASON BASED VENTILATION

The building can be ventilated naturally thanks to strategically placed, openable, windows as well as slab openings and the stack effect. The polycarbonate envelope is openable (vertically) in the top, and also (horisontally) on the ground and first floors, creating air flows through the building.

The shafts between new volumes and old walls are used as installation channels. Ducts for the mechanical ventilation run here. Spaces like kitchens and bathrooms that produce contaminated air are placed towards the installation channels. Towards the roof, above the existing walls, fans and outlets are integrated underneath the roof.

Rainwater from the roofs is collected and the grey water is used as flushing water for toilets and irrigation for both the winter gardens and the greenhouse.



PV/T HYBRID PANELS
~ 400 M²

The combined photovolatic cells and thermal collector panels is a more efficient way of using the solar energy. The PV cells produce electricity and the thermal collectors heat water in an accumulator tank.

The new structures are heated and controlled through floor heating. It is flexible and runs on re-newable sources.

TEMPERATURE MONITORING SYSTEM

-5°
OUTDOOR

The monitoring system controls the hot water flow in the wall and floor heating as well as ventialtion needs.

PERMEABLE GROUND SURFACES

The surrounding ground surfaces are permeable rather than hard in order to manage storm water.

WATER BASED WALL HEATING

Large water pipes run in slits along the inside of the brick walls. The wall heating primarily protects the structure of the building by keeping it warm, at the same time as it is heating the raw spaces inside. A flexible and sustainable heating system relying on re-newable energy.

FEED BACK OVERFLOW TO GRID

DISTRICT HEATING GRID

The building is connected to the district heating grid, mainly as a backup system when the solar energy, especially in winter, might not be sufficient. District heating uses re-newable energy sources to a large extent, and is regarded as 'green'. The electricity produced by the building might be more than needed, especially in

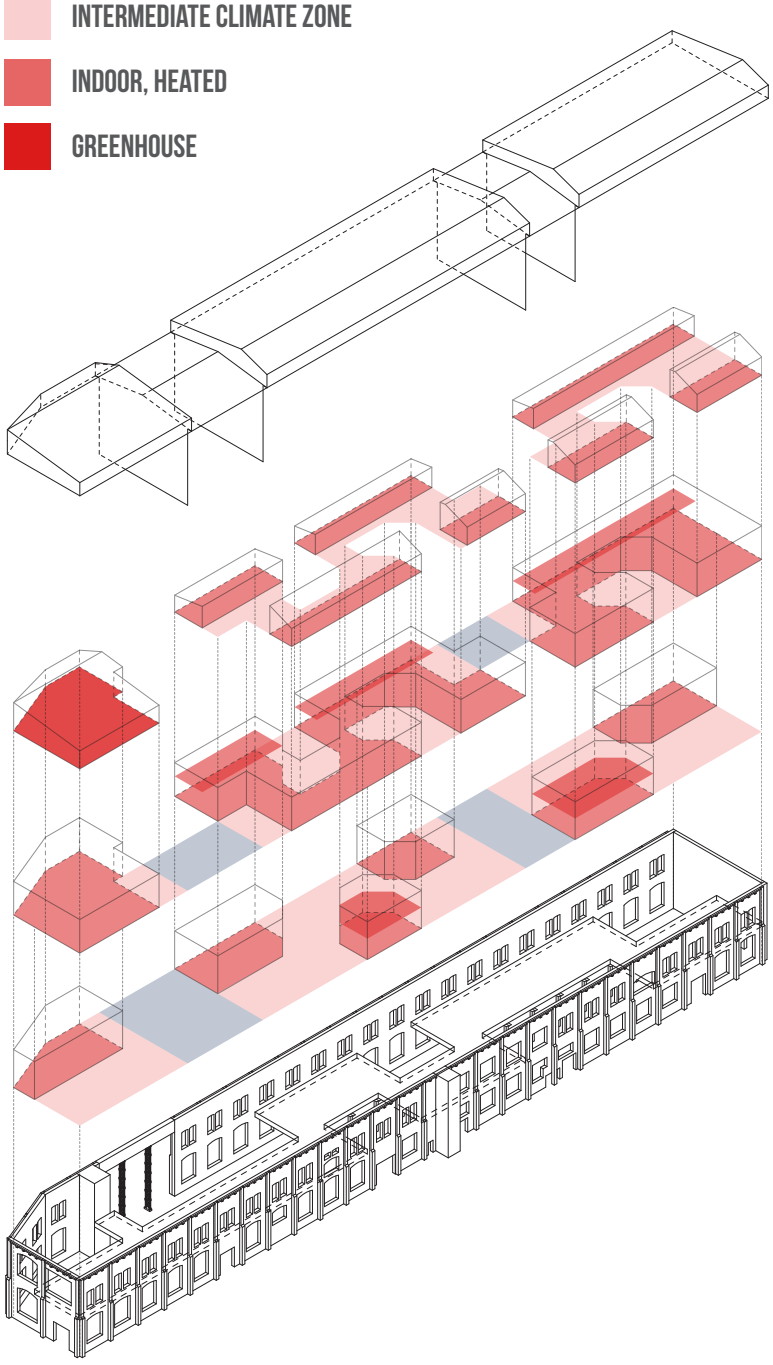
CLIMATE ZONES

NOT HEATED

INTERMEDIATE CLIMATE ZONE

INDOOR, HEATED

GREENHOUSE



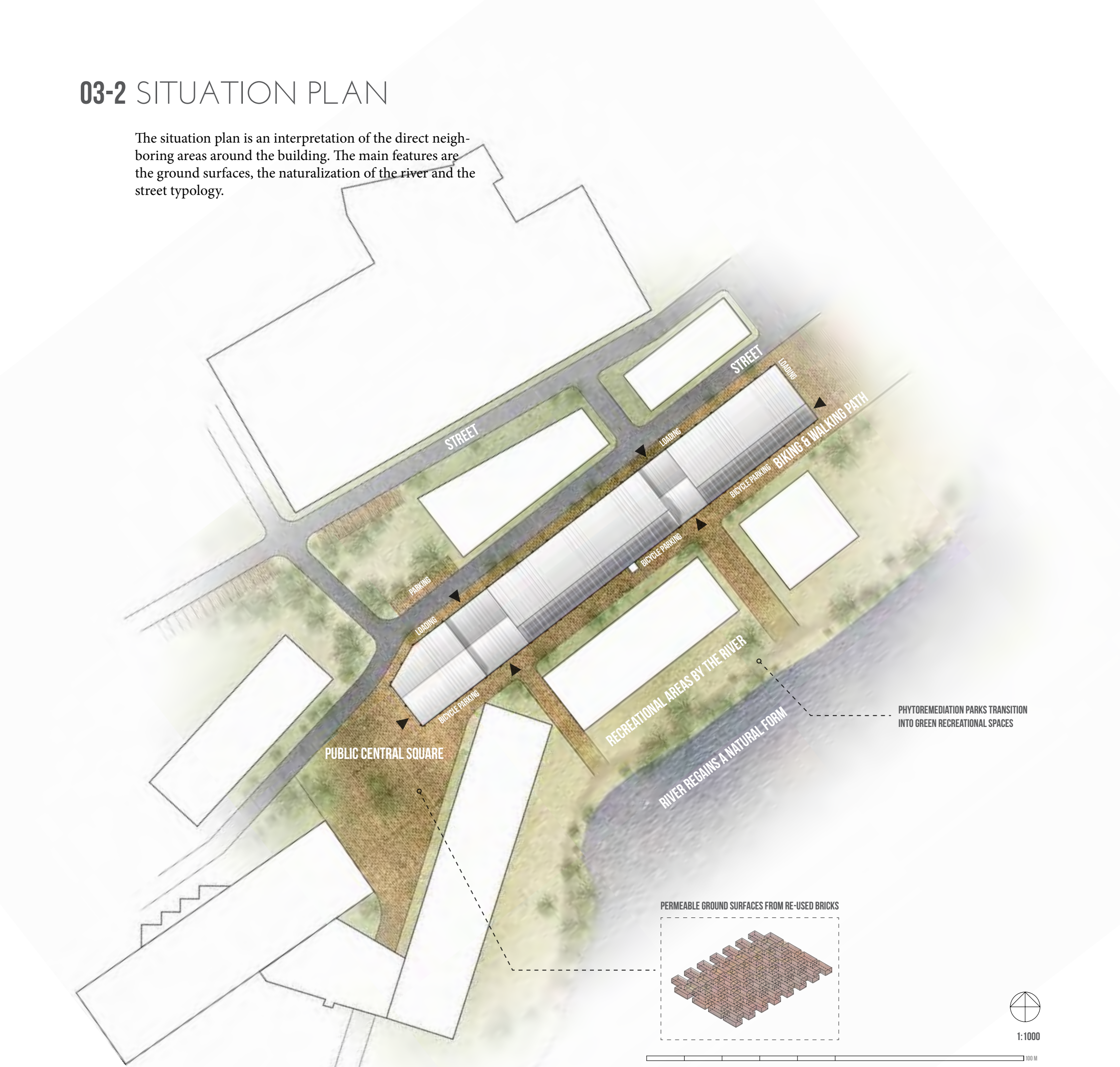
Weather and climate become elements on the inside of the building as well. Variations and gradients are allowed to tell what the weather is up to, and to inspire user action. The seasons are present, and the weather enters the building in a way. “That sort of invasion we would condemn in a new building and blame the architect, but in a ratty old building - designed for some other use, after all - there’s no one to blame.” (Brand, 1994)

The polycarbonate envelope, together with the existing structure, form the outer climate and weather envelope. The newly inserted volumes create a second layer envelope towards the fully heated areas. Creating an intermediate climate zone in the building brings down the temperature difference towards the indoor zone, giving the possibility of a simpler construction.

SUMMER SCENARIO	WINTER SCENARIO
20°C	-5°C
18-24°C	13-15°C
20°C	20°C
28°C	16°C

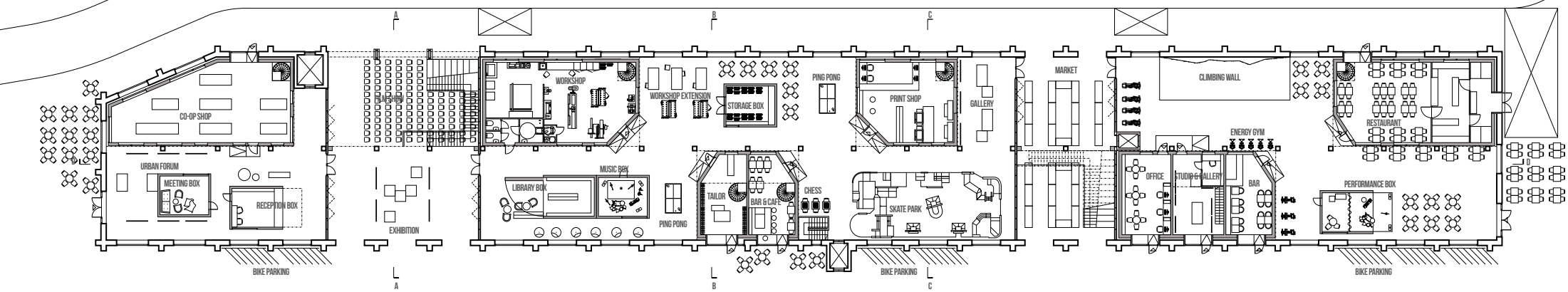
03-2 SITUATION PLAN

The situation plan is an interpretation of the direct neighboring areas around the building. The main features are the ground surfaces, the naturalization of the river and the street typology.



03-2 GROUND FLOOR

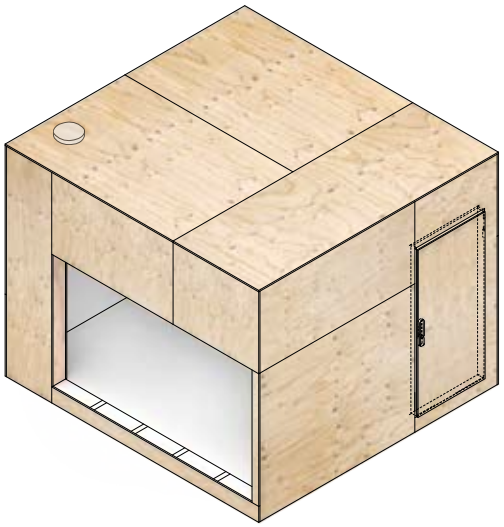
On ground level, the street life flows into the building where two outdoor spaces, although within the building walls, create transitions between what is outside and inside the building. The three intermediate climate zones make up the three main interconnected parts of the building. Public functions are spread out through the raw space with great adjustability, variability and potentials. Indoor functions, being more permanent, take less space but keep a public character as well.

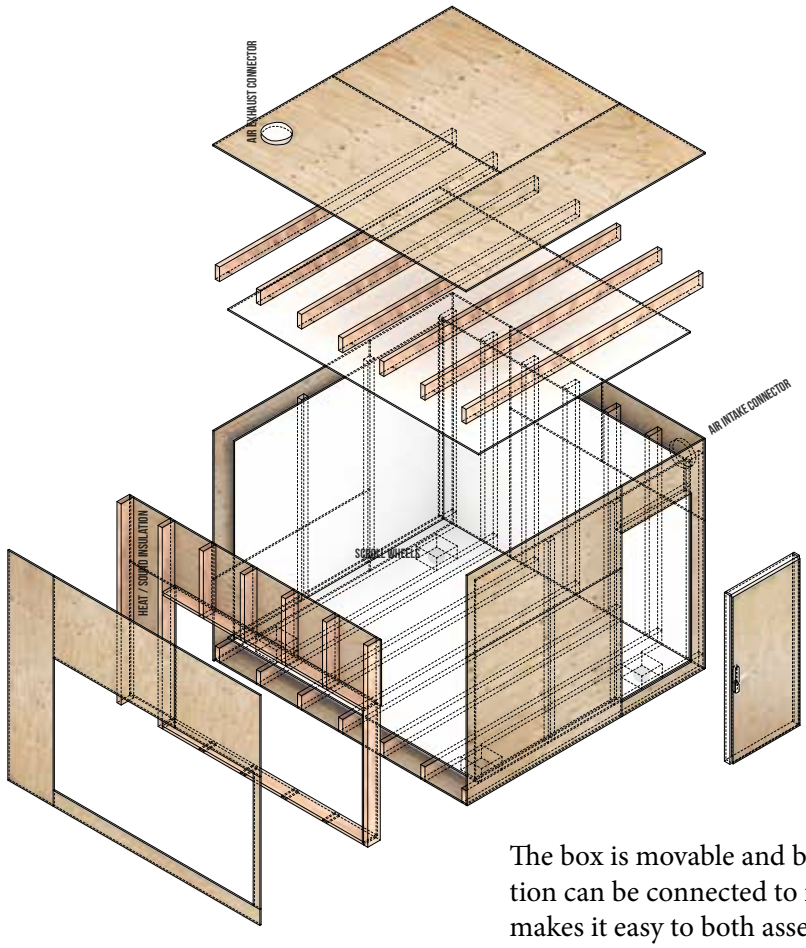


1:500

10 M

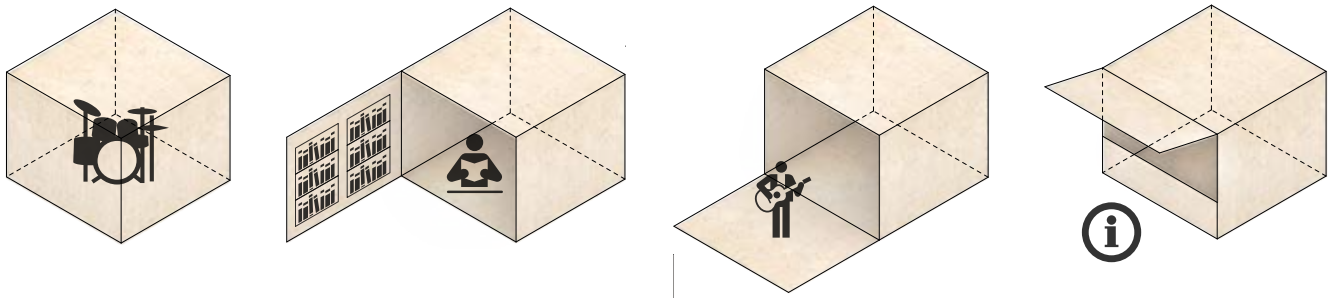
MULTI FUNCTIONAL BOXES





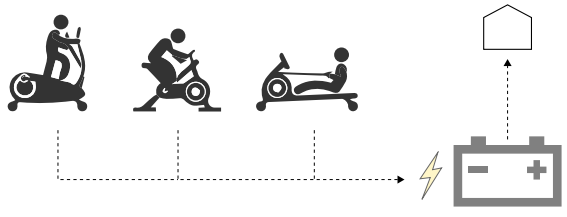
The boxes are an integral part of the ground raw space. They create smaller, enclosed, spaces for a wide variety of acitivities, going hand in hand with the idea of variability and adjustability. A box could, for example, be a rentable work space, a small music studio, a stage, a library, a meeting room or serve as the information desk for the building.

The box is movable and both electricity and ventilation can be connected to it. The simple construction makes it easy to both assemble and disassemble so that it can appear and disappear according to needs and demands.



ENERGY GYM

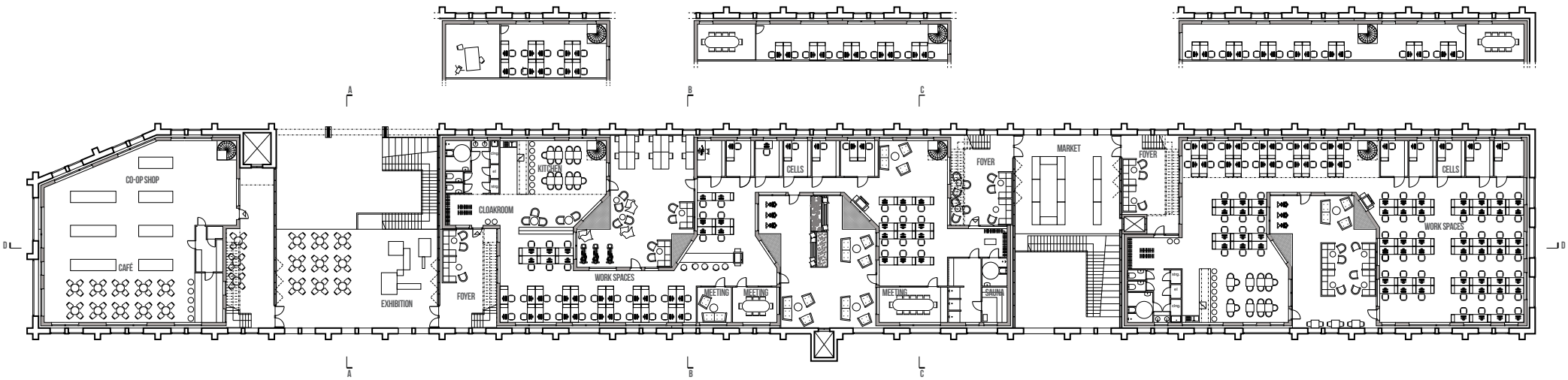
Physical activities are present in different forms in the building. The energy gym is a fun, healthy and alternative way of producing electricity. Rowing machines, cross trainers and training bicycles are available and usable by anyone. The mechanical movements are driving a generator charging central batteries. The stored energy can later be used by the building.

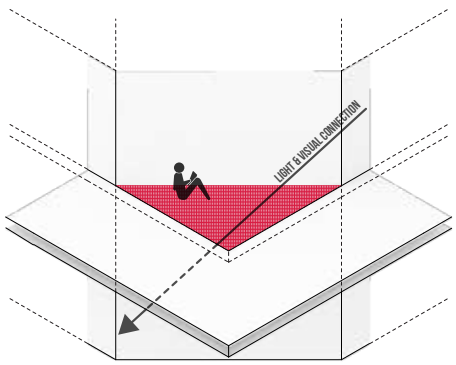



PRINT

03-2 FIRST FLOOR

Moving up one level, the amount of raw space decreases and indoor space increses significantly. Big atriums inside the intermediate climate zone provide lots of light and changes of pace of spaces. Mainly, this floor holds spaces for work in different forms. Open office spaces, variable cells, alternative seating and working spaces. More public functions still have a part, mainly being the co-op shop and the two outdoor spaces, climbing up and extending from the ground floor.





SLAB OPENINGS

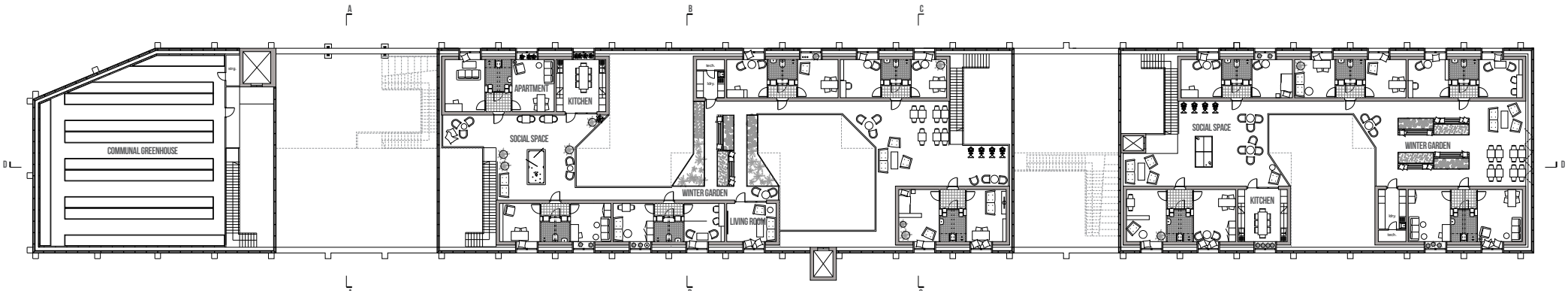
The slabs are opened up where new structures are coming down, and the angles of the structures give triangular openings between the floors. The main reason is to provide the ground floor with light, but also to give a visual connection between the floors. A chance to get a glimpse of what is going on on the other floors or even outside. Between the ground and first floor, instead of putting up rails around these openings, they are covered with elastic nets. The nets are a safety as well as an alternative seating, or a surface where one can lay down.

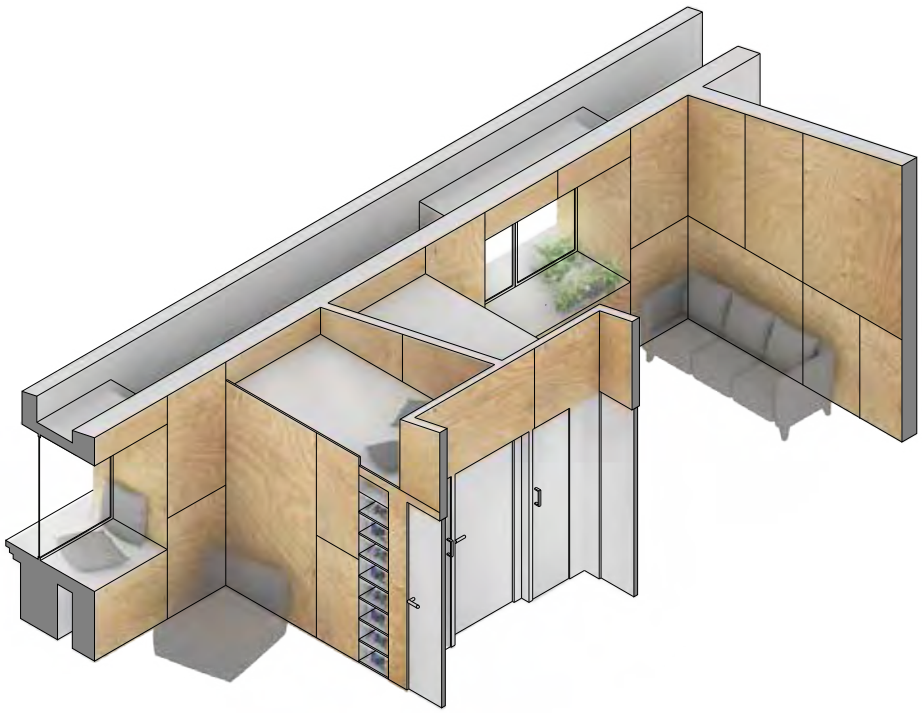
1:500

10 M

03-2 SECOND FLOOR

The top floor is the most private, and the main functions are housing and greenhouse. On this floor the three parts of the building are separately accessible to further strengthen the more private character. In the two housing parts, kitchens, small living rooms and laundry rooms are shared. Most important though among the shared spaces is the larger social space, which is a meeting ground for the inhabitants, winter garden, and perhaps an alternative working space during day time. The communal greenhouse in the south-west part is shared with people in the neighbourhood.





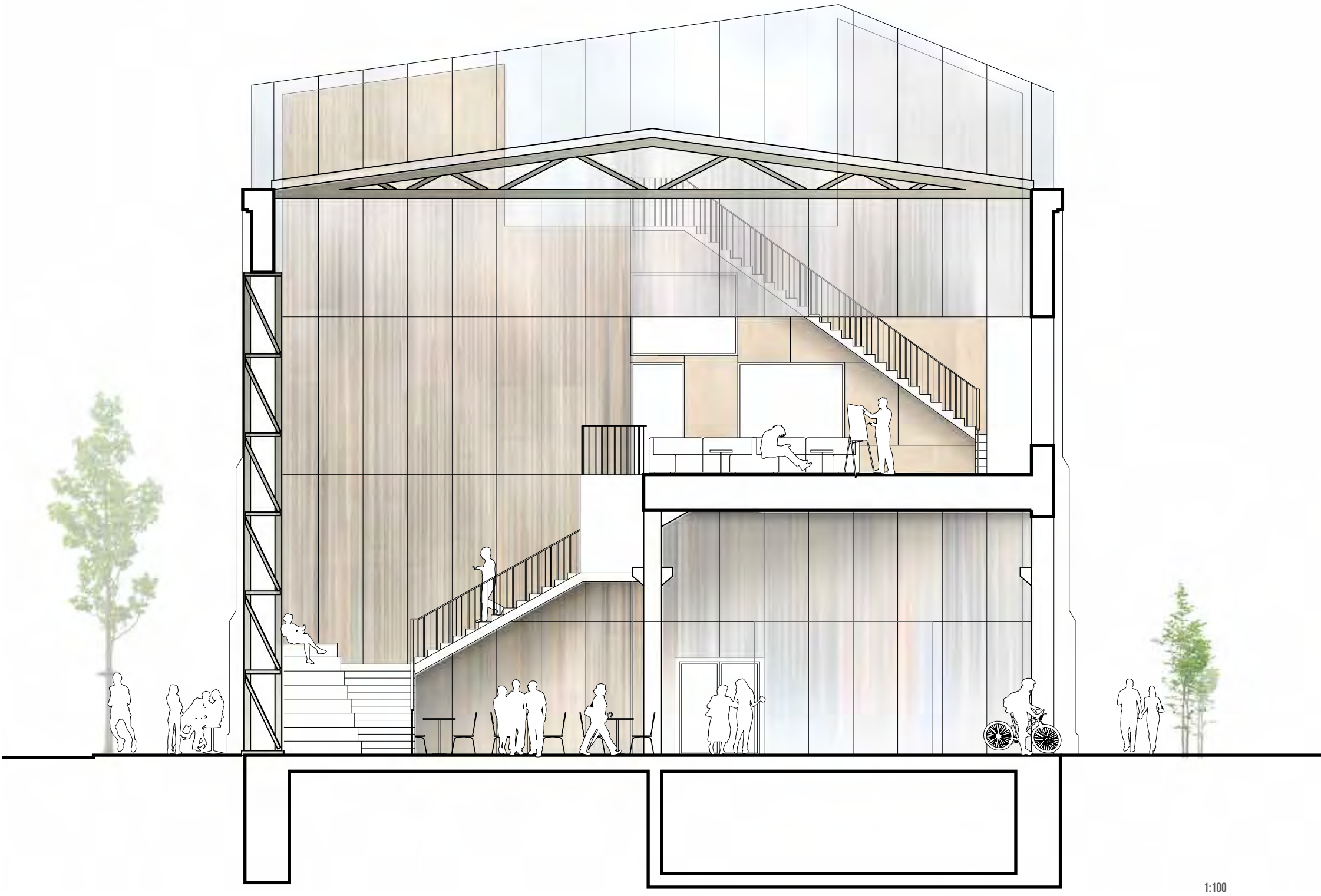
COMPACT LIVING

The alternative housing concept is based on compactness, sharing and social encounters. The smaller, private rooms are part of a larger context being the large social spaces in the intermediate climate. Two rooms comprise one unit, sharing one entrance and one bathroom. Ten or twelve rooms share one kitchen and laundry each. This can be compared to student housing, but is open for non-students too, and with more commonunal space. Together with the shared bathroom, a core is constructed in each unit with different kind of storage spaces and loft beds. This gives the rooms a lot of free space and walls to furnish and use the way you like. The room has a large openable window that bridges over the two building envelopes. This gives a deep niche that can be used as seating, a table or a place for plants.

1:500

10 M

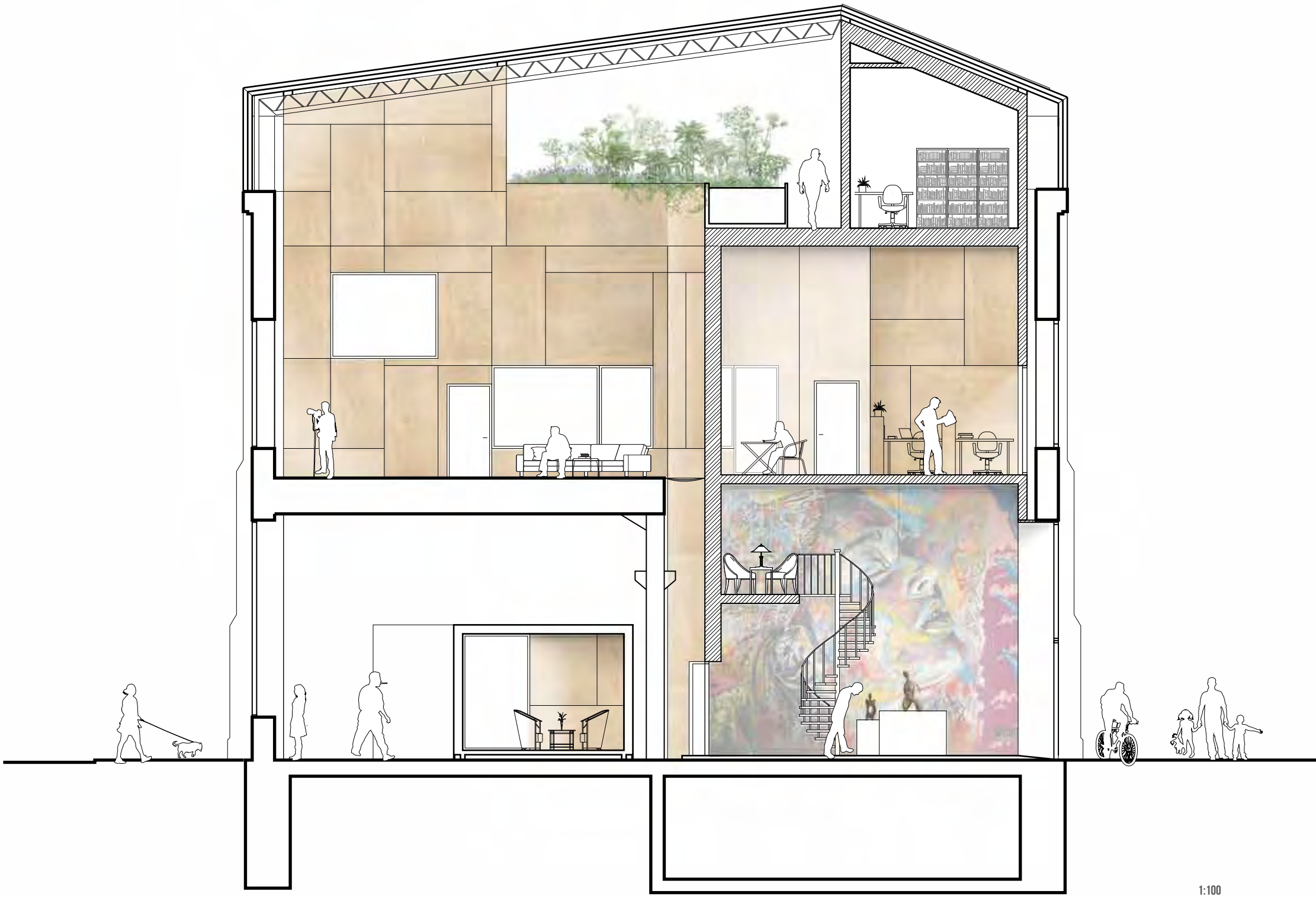
03-2 SECTION A-A



1:100

10 M

03-2 SECTION B-B




Flyttlåda
Mellan

03-2 SECTION C-C

1:100

10 M

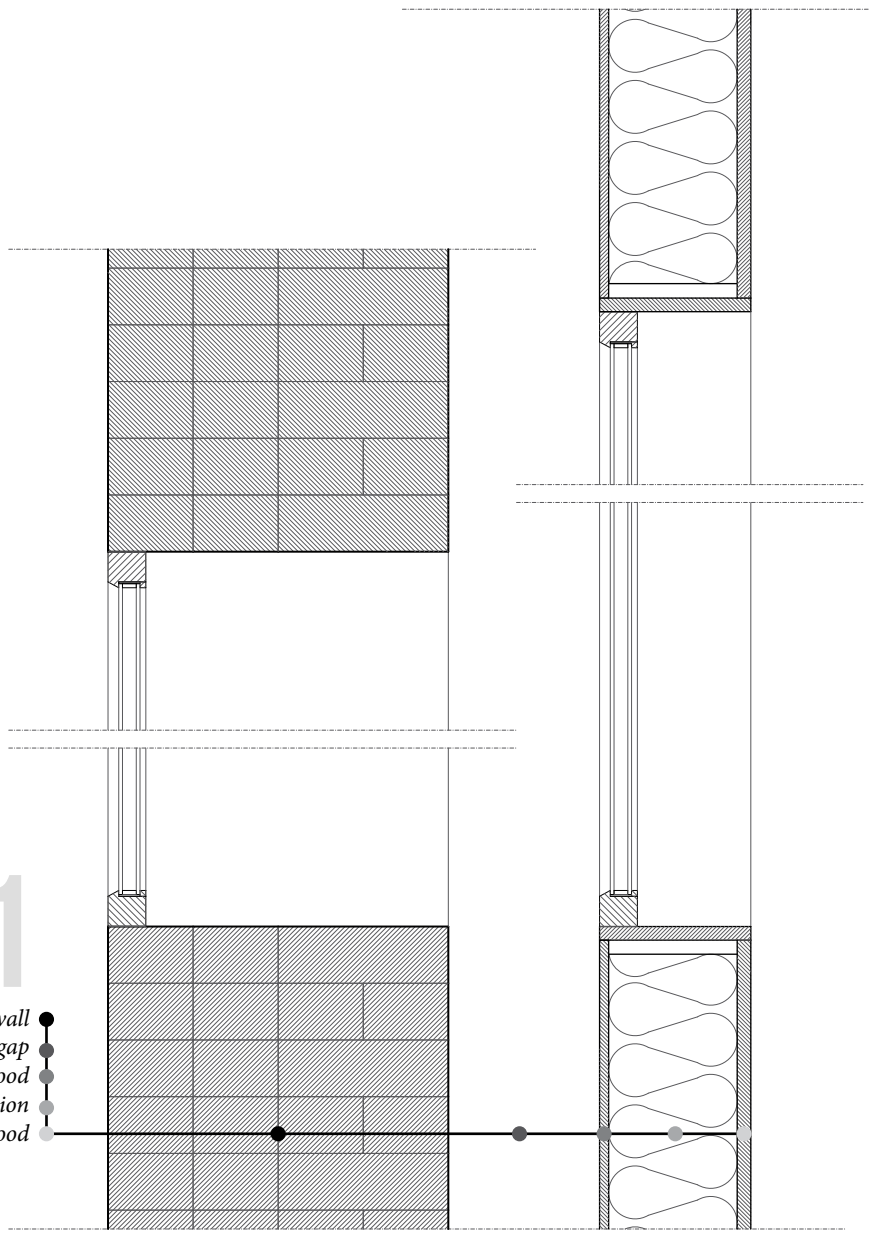
03-2 DETAILS

These detail drawings show different ways of how new structures in the building meet the old. On the previous page it is indicated approximately where the details are located.

1. The new structure stands with an air gap from the existing brick wall. The old facade is fitted with new high performing glass. The inside construction can be rather simple thanks to the double envelope.

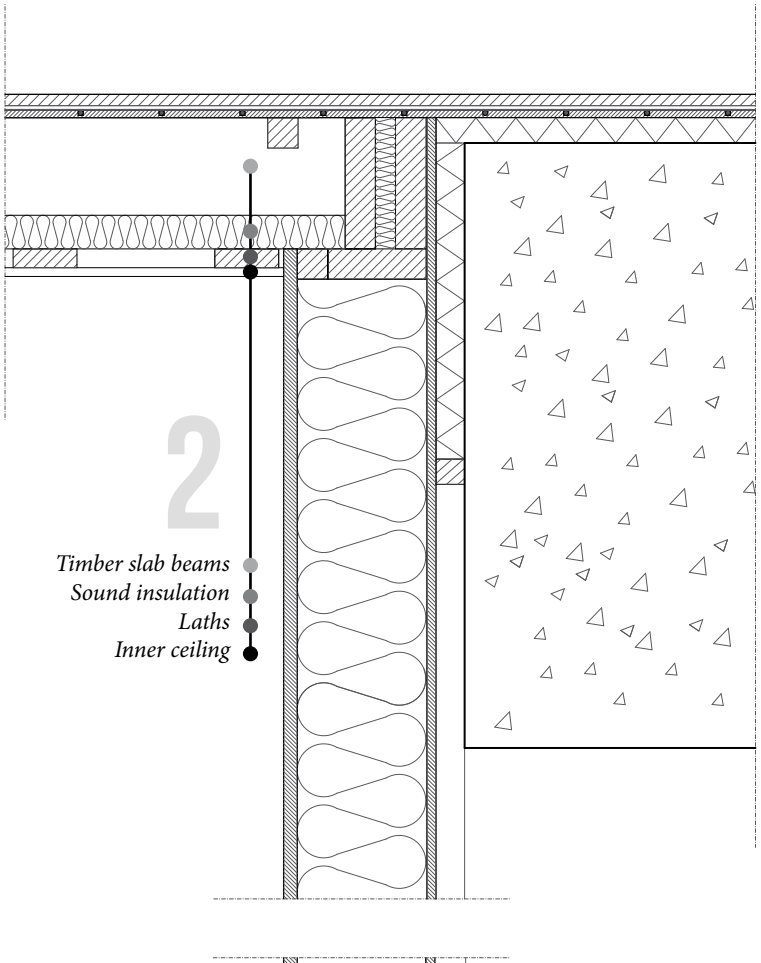
2. New wall and slab meet the existing concrete slab, and the new floor includes a water heating system. Critical heat bridges are avoided.

3. New wall and floor meet the existing concrete ground slab.



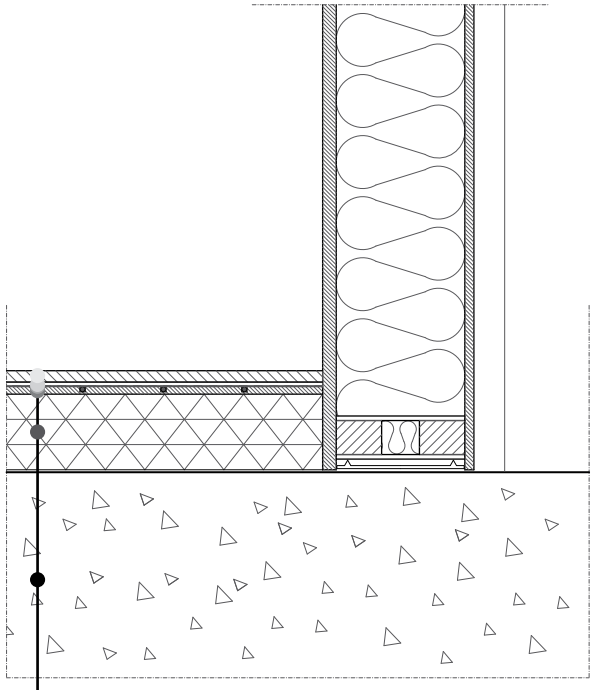
1

450 mm brick wall
200 mm air gap
12 mm plywood
170 mm timber posts / insulation
18 mm plywood



2

Timber slab beams
Sound insulation
Laths
Inner ceiling



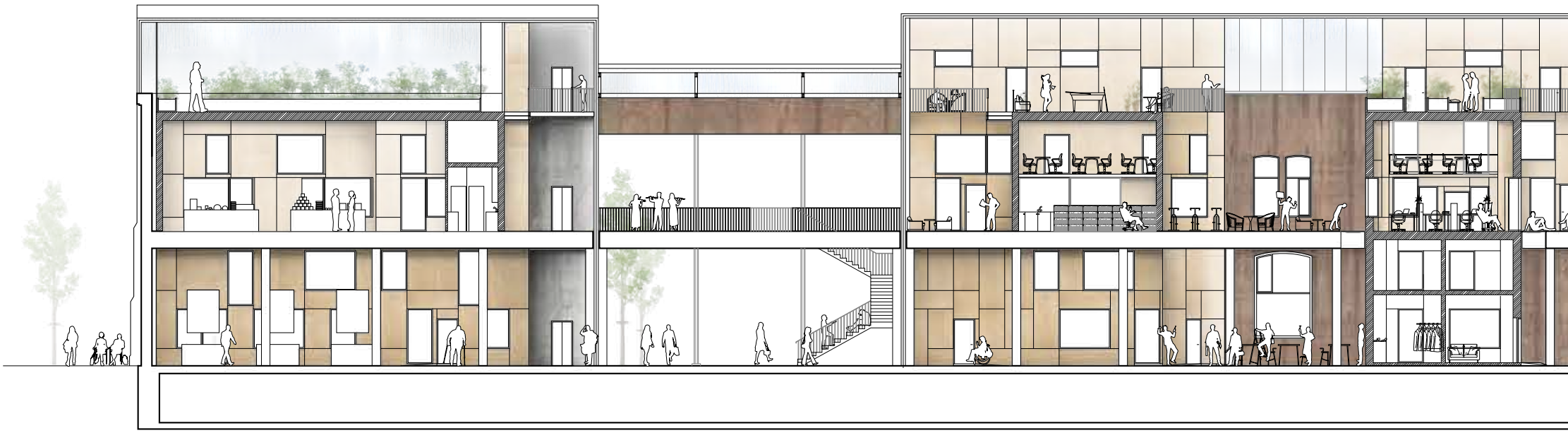
3

Foundation concrete
150 mm insulation foam
Floor heating installation chipboard
Vapor barrier
Foam
Wooden floor

1:10

1 M

03-2 SECTION D-D



1:250

10 M

03-2 FACADES

The existing brick facades are exposed once again after being built in by surrounding buildings. The rough and motley character is kept, however restoration work is done where needed. This is carried out with re-used bricks from the demolitions of other buildings in the area.

The main idea with the facades is to define time layers; to show what is new and old. To create contrasts. The new structures' facades, of plywood, are composed in a modular way, with modular windows as well. Thereby, it is formed in a way to both create contrasts in the same time as it is adapting to the material itself. New windows with steel mullions are placed in the old window openings in the brick wall. The mullions divide some windows into openable parts, but more importantly, the horizontal mullions help avoid downdraughts because of too great window heights.

The unsynchronized divisions and meetings between old and new highlight the contrasts, but can also be a way to control the amount of daylight and solar gains to the inside. In that way it is also a way of reflecting and relating to the inner, new functions.

The polycarbonate envelope honestly displays the new additions and three distinguishable parts of the building. Furthermore it lets through a lot of light and fills an important climatic purpose.

N-W

S-E

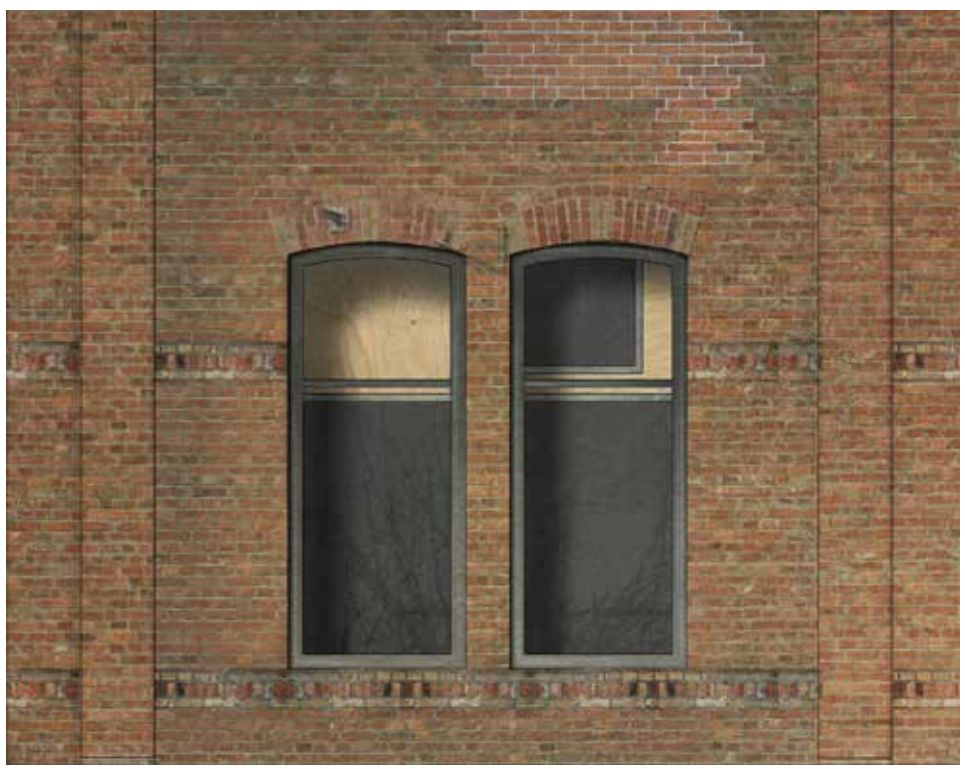
S-W

N-E

1:500

10 M

FROM OUTSIDE



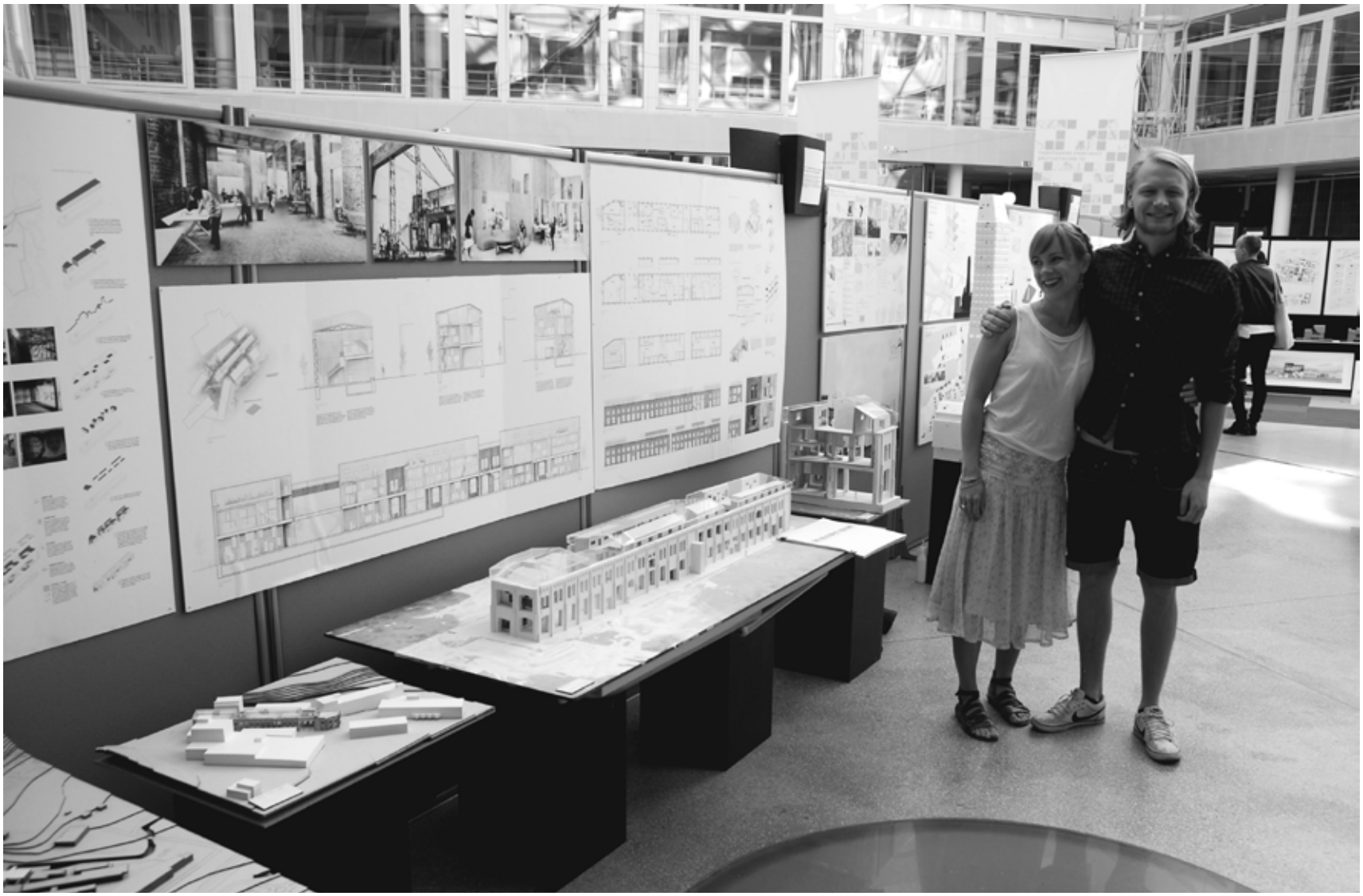
FROM INSIDE

03-3 EXHIBITION

MODEL 1:500

MODEL 1:100

SECTION MODEL 1:50



The project was presented on May 26 2014 at Chalmers University of Technology during the annual master thesis exhibitions.

Final seminar critics: Catarina Canas (OMA) & Klas Moberg (UNIT Arkitektur)

Final presentation / exhibition censor: Alberto Altes (Umeå University)

04 DISCUSSION & PROCESS

04-1 CONCLUSION & REFLECTION

04-2 PROCESS SAMPLES

04-2 CONCLUSION & REFLECTION

When looking back at the process and development of this project, and what expectations we had going into it, we can tell that the task has been both complex and very interesting. Spending time researching the themes that this project includes gave us even more depth and more and more layers quickly appeared. The fact that the task is very timely and relevant, both locally and globally, further spurred and inspired us. Developing the building functionally and strategically, at the same time as finding an architectural transformation language that corresponded to these ideas, came to be the most important design aspect. Studying reference projects, of different characters and for different reasons, and also relating to theory around relevant themes (mainly building re-use and industrial transformation) gave us a good base to work from. Furthermore, the quite thorough background studies and analyzes, of both the building and the site, were essential and helped building the foundation for the project and many design decisions.

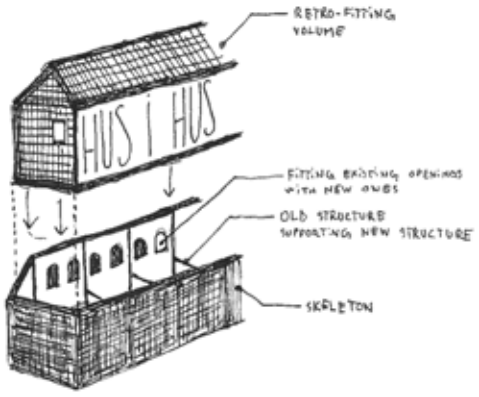
In today's global society of urbanization, population growth and climate change, it is essential to care for our already built (and un-used) environment as a resource. Locally, part of the idea was to present an alternative to how the process of building in general looks like in Sweden, and also specifically to the development in Mölndal. Unplanned re-usage forms are extremely rare because of strong regulations and legislations. However, we don't need to look too far at all outside our borders to see successful and very appreciated projects of more unplanned or temporary character.

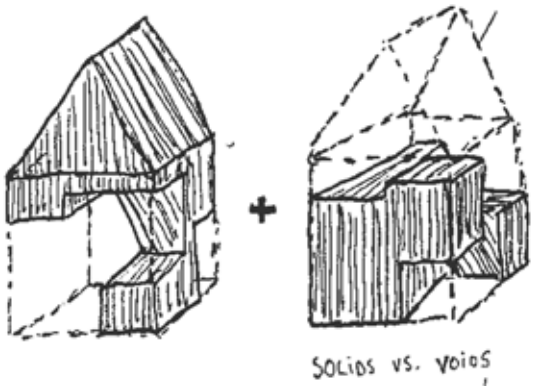
Buildings like Building 10 have their special features and a relation to history. This factory, and the future of the whole area, will attract involvement from the local population. The stability and openness of the building makes it adaptable and flexible which allows it to be transformed to a creative, authentic and powerful place where people can live and work.

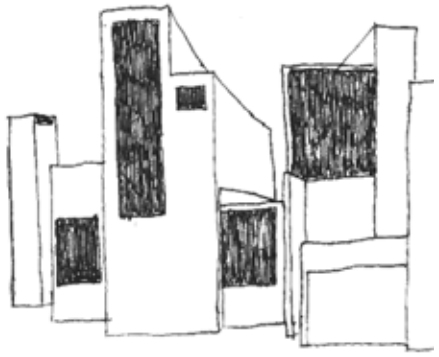
The design that we present is a vision of what a gradual, evolutionary development could be after a certain amount of time. The road however, how to get to this point, is more unclear. Not studying several stages of the development and design in more detail could be regarded as a weakness, but at the same time it is a delimitation that we very consciously made.

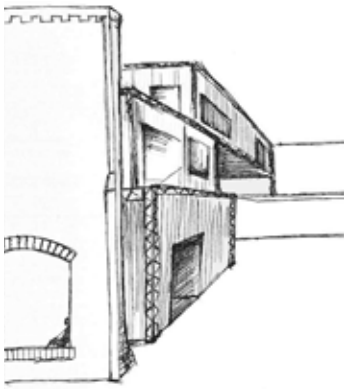
The work that we present is the fruit of an ongoing discussion around program and functions translated into architecture. The thorough investigation of the history gave us a foundation to how to continue the evolution of the building. We wanted to add something to the existing that left the building with its present character and even strengthen it. The new structure stands lightly in the heavy shell of the former paper factory and tiptoes through the whole building. It works in a way as a parasite, but a parasite that lives in symbiosis with its host.

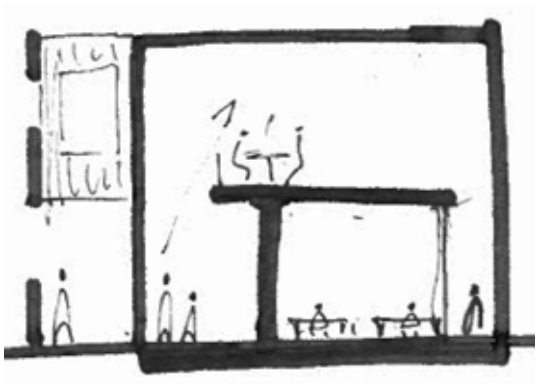
04-2 EARLY SKETCHES - FORM AND CONCEPTS

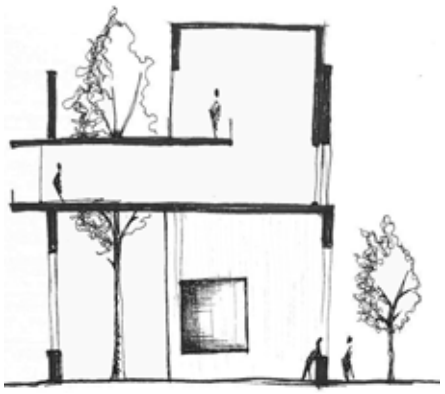






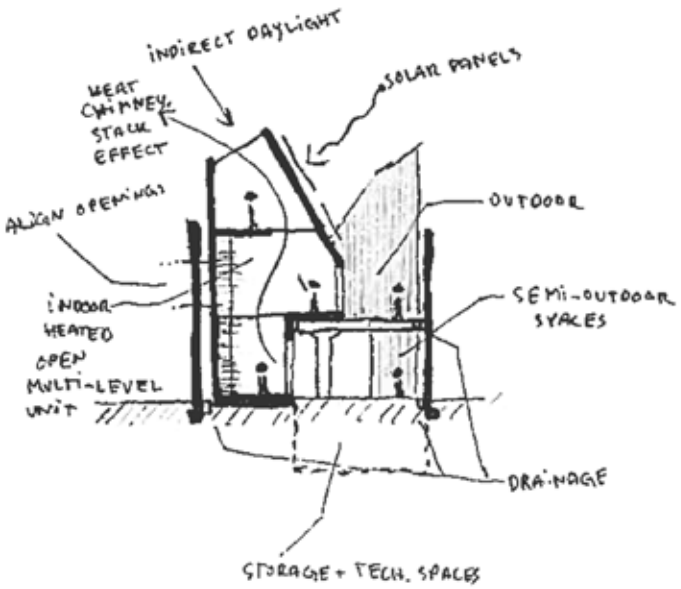


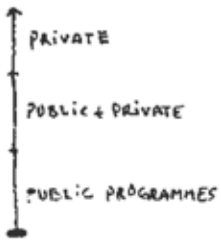


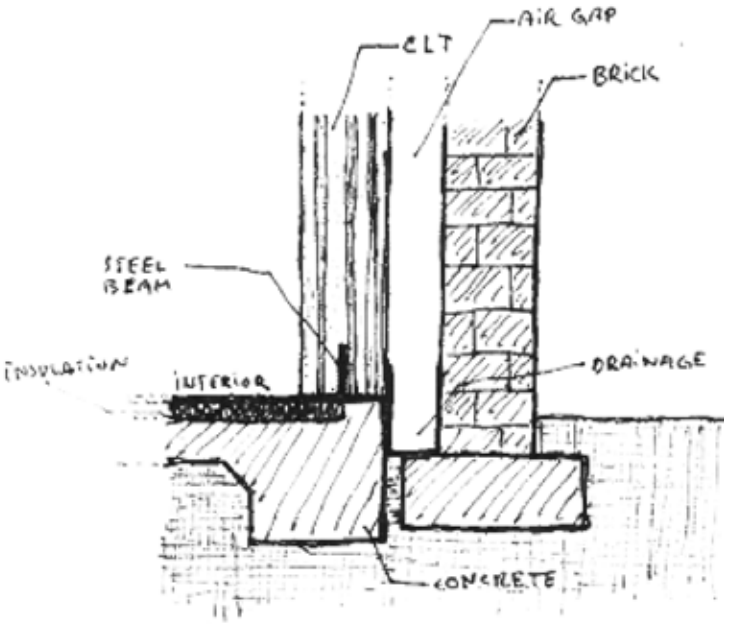


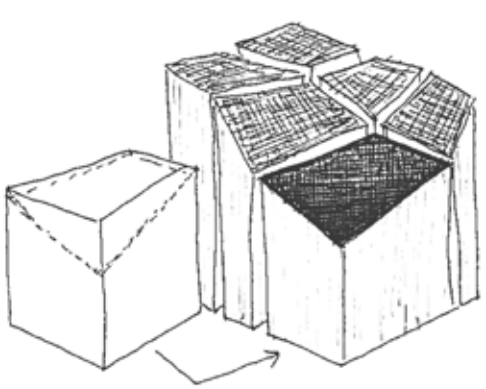
04-2 EARLY SKETCHES - SECTIONS

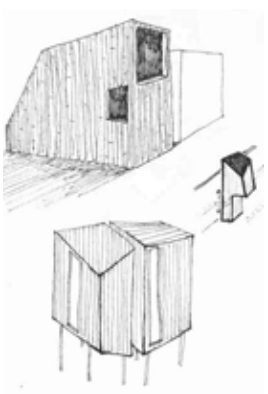
The early working sketches range from conceptual ideas to detailed solutions, addressing the wide scope of scales.

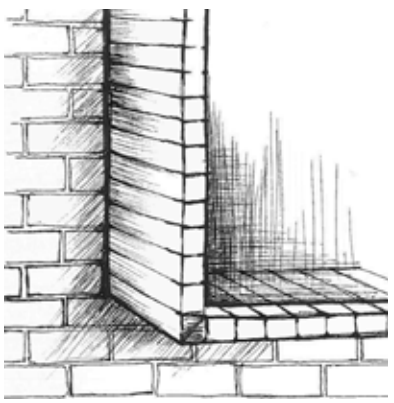






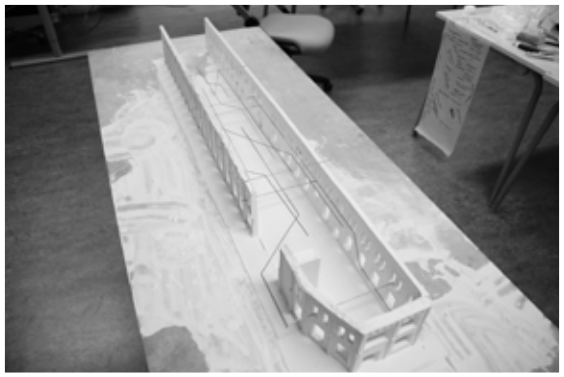






04-2 MODEL STUDY

THREADS - MOVMENT


SURFACES - LIGHT

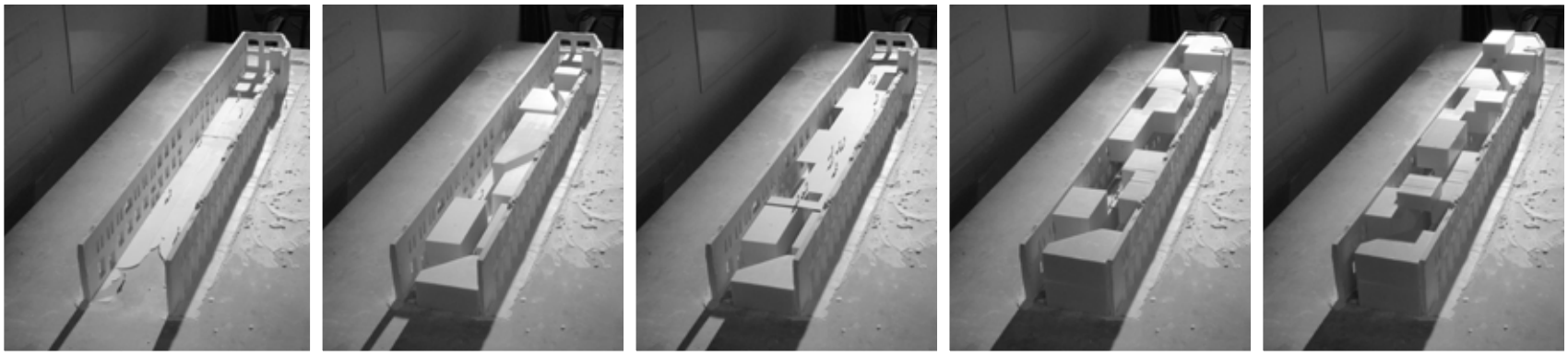


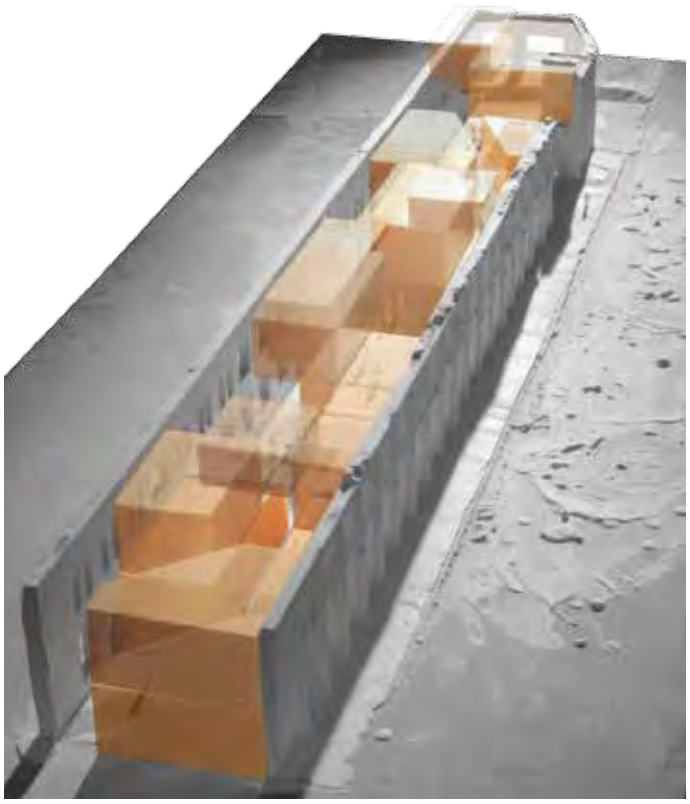





04-2 MODEL STUDY

VOLUMES





In the first phase of the design process we studied different ways of dealing with the building an terms of volumes, light and movement through a range of physical models. This was a way to get to know the building and its possibilities, and also a way to continously beeing able to work with the existing structure and space.

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CONTACT

ANDREA BRANDÉN

BSc in Architecture
Erasmus exchange ETSAV Barcelona
MSc in Architecture

andreabranden@gmail.com

+46 (0) 736 41 02 63

TOBIAS GÖTHFELT

BSc in Architecture & Engineering
Erasmus exchange ETSAV Barcelona
MSc in Architecture

tobias.gothfelt@gmail.com

+46 (0) 730 28 88 06